REPORT RESUMES

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INSTRUCTIONAL SYSTEMS DEVELOPMENT--A DEMONSTRATION AND EVALUATION PROJECT. FINAL REPORT.

BY- BARSON, JOHN
MICHIGAN ST. UNIV., EAST LANSING
REPORT NUMBER BR-5-1411 PUB DATE 1 JUN 67
CONTRACT OEC-5-16-025
EDRS PRICE MF-$0.50 HC-$5.08 125P.

DESCRIPTORS- *SYSTEMS DEVELOPMENT, *INSTRUCTIONAL DESIGN, *INSTRUCTIONAL IMPROVEMENT, *INSTRUCTIONAL MEDIA, MODELS, DEMONSTRATION PROJECTS, STATISTICS, ENGLISH INSTRUCTION, MANAGEMENT, PHILOSOPHY, EDUCATION, PSYCHOLOGY, GEOGRAPHY INSTRUCTION, ECONOMICS, HISTORY INSTRUCTION, INFORMATION DISSEMINATION, INSTRUCTIONAL MATERIALS CENTERS, DECISION MAKING, MICHIGAN STATE UNIVERSITY

FOUR UNIVERSITIES COOPERATED WITH THE INSTRUCTIONAL MEDIA CENTER AT MICHIGAN STATE UNIVERSITY TO TEST, DEMONSTRATE, AND REFINE A MODEL FOR MEDIA INNOVATION AND INSTRUCTIONAL DEVELOPMENT WHICH HAD BEEN DESIGNED IN A EARLIER PROJECT. MEDIA, EVALUATIVE, AND INSTRUCTIONAL SPECIALIST CAPABILITIES WERE TEAMED TO THE DECISION PROCESSES OF THE INSTRUCTORS AND BROUGHT TO BEAR ON INSTRUCTIONAL PROBLEMS UNDER THE GUIDANCE OF THE MODEL'S PRECONCEIVED, SEQUENTIAL SYSTEM OF DECISION MAKING. EACH UNIVERSITY STAFF SUBMITED TAPE RECORDINGS OF ALL MEETINGS, EXPECTATION AND REACTION FORMS, SUMMARY LOGS, AND QUARTERLY AND TERMINAL REPORTS. PROJECT COURSES CHOSEN HAD LARGE ENROLLMENTS AND WERE IN ENGLISH, STATISTICS, MANAGEMENT, PSYCHOLOGY, PHILOSOPHY OF EDUCATION, ECONOMICS, AND GEOGRAPHY. ALL PARTICIPANTS IN THE INSTRUCTIONAL DEVELOPMENT TRIALS FOUND THE DECISION STEPS FLOWCHART TO BE PRACTICAL IN ANALYZING AND IMPROVING THE TEACHING APPROACH, BUT DUE TO DIFFERENT STYLES IN DECISION MAKING AND TO TROUBLE IN INITIALLY SPECIFYING BEHAVIORAL OBJECTIVES FOR THE COURSES, THE FLOWCHART WAS USED IN A VARIETY OF DIFFERENT WAYS, AND SEVERAL OF THE PROJECT TEAMS MODIFIED IT TO FIT THEIR NEEDS. DISSEMINATION OF INFORMATION CONCERNING THE PROJECT WAS CARRIED OUT THROUGH VISITS, CONFERENCES, AND PRESENTATIONS TO PROFESSIONAL MEETINGS. (BB)

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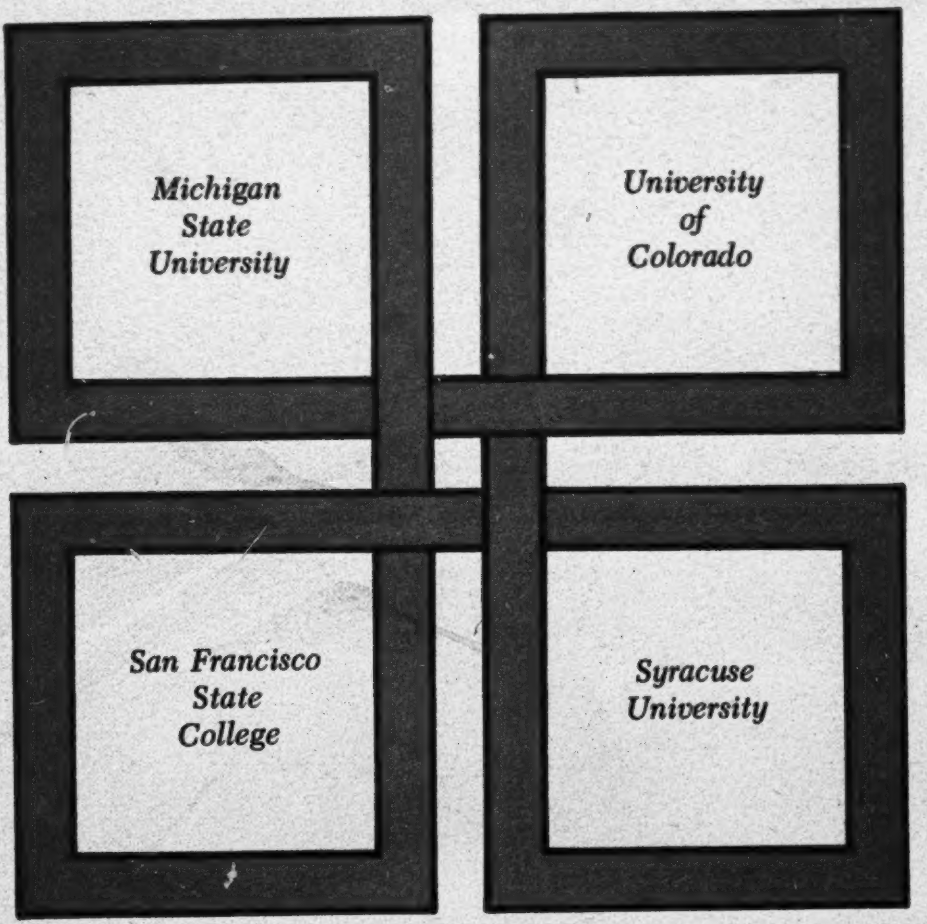
FINAL REPORT

GRANT NO. OE - 5 - 16 - 025

INSTRUCTIONAL SYSTEMS DEVELOPMENT

A Demonstration and Evaluation Project

JULY 1, 1967


Michigan State University
University of Colorado
San Francisco State College
Syracuse University

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education/Bureau of Research

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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INSTRUCTIONAL SYSTEMS DEVELOPMENT:
A DEMONSTRATION AND EVALUATION PROJECT.

Dr. John Barson, Director

CONTRACT NO. OE-5-16-025

June, 1967

The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

MICHIGAN STATE UNIVERSITY

East Lansing, Michigan

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PROJECT STAFF

Coordination Unit
Michigan State University

Director: Dr. John Barson
Assoc. Director: Dr. Horace Hartsell

Advisory Committee
Michigan State University

Dr. John E. Dietrich, Director
Educational Development Program
Dr. Charles F. Schuller, Director
Instructional Media Center
Dr. Paul L. Dressel, Director
Office of Institutional Research

DEMONSTRATION TEAMS

University of Colorado
Bureau of Audiovisual Instruction:

Dr. Robert E. de Kieffer
Dr. David Saunders
Dr. Louis H. Brown
Dr. Donald K. Darnell

San Francisco State College
Center for Educational Technology

Dr. A. Daniel Peck
Mr. Francis X. Moakley
Dr. Freeman F. Elzey

Michigan State University
Instructional Media Center:

Dr. Horace C. Hartsell
Dr. Robert H. Davis
Mr. Wilfred Veenendaal
Mr. Richard A. Margoles

Syracuse University
Center for Instructional Communications

Dr. Eugene K. Oxhandler
Mr. Thomas E. Burford
Dr. Kenneth N. Fishell
Mr. Milton I. Patrie
Miss Joan I. Novak

EVALUATION TEAM

Dr. John M. Gordon
Teaching Research Division
Oregon System of Higher Education

Dr. Phil C. Lange
Teachers College
Columbia University

Dr. John B. Haney
University of Illinois
at Chicago

Dr. John Childs
College of Education
Wayne State University

ACKNOWLEDGEMENTS

It is doubtful that general development procedures for improving instruction in higher education through the use of the newer media of communication can be patterned after the accomplishment at any single institution. Varying conditions existing at different institutions make the generalization of any given plan hazardous. More likely, the design of a broadly applicable approach to implementing media in college courses will be achieved, much as is other progress in the academic community, through diverse experimentation and a mutual sharing of knowledge and findings.

This was the chief contribution of the consortium of universities which joined to conduct this investigation of media in instructional development. The participants at each institution added new dimensions to the study through their unique talents and experience in the improvement of college courses. Each possessed the dedication and fortitude to take the hard look at present instructional practices needed to bring about changes. This strong sense of purpose in faculty members, administrators, and specialists is demonstrated by the remarkable fact that they consented to tape recordings of discussions and transactions for analysis by evaluators from outside institutions. This willingness to candidly scrutinize classroom practices and consider media reforms is in the best tradition of scholarly research and suggests that the methods of college instruction are not nearly as intransigent as is generally believed.

The investigators wish to thank the faculty members, administrators and specialists at Michigan State University, Syracuse University, The University of Colorado, and San Francisco State College for the contributions made to this unique study. In addition, they express appreciation to the Dissemination Research Branch of the U. S. Office of Education for the study grant and advice freely given.

THE PROJECT STAFF

CHAPTER I: INTRODUCTION

It is common knowledge that growing student enrollments and the dearth of professorial talent have forced many colleges and universities to seek new ways of meeting instructional obligations. Some have chosen to establish new liaison groups, such as the Educational Development Program at Michigan State University, charged with the task of facilitating more effective ways of meeting growing instructional demands. These demands frequently result in the use of the newer media of communications. With few models for guidance, the newly-formed groups have been searching for a viable organizational structure and accompanying set of operating procedures.

It was the awareness of this need that prompted the 1963-65 study at Michigan State University, A Procedural and Cost Analysis Study of Media in Instructional Systems Development. A major portion of this investigation was given over to the development and field testing of an organization and operation which could serve as a model instructional development system. The development model consists of an organizational scheme which differentiates substantive personnel specialties and the steps of instructional development. The decision sequence and respective information needs were derived in the analysis of actual course development work by faculty members and specialists over a five-year period.

Recognizing the possibilities of further model refinement and dissemination, the findings were incorporated into a project at four universities, the outcomes of which are described in this report. In what might seem a unique move, investigators at Michigan State University heeded advice from Brickell, Rogers, Miles, et al., which boils down to the statement of Brickell:

> The most effective way to convince a school staff that it should adopt a new program is to let it observe the successful new program in action. Nothing persuades like a visit.

This major demonstration program enlisted the aid of Michigan State University, University of Colorado, San Francisco State College, and Syracuse University. These institutions exhibited a readiness and willingness to move into full-scale instructional planning and had expressed a need for an organizational structure and accompanying operating procedures -- a development system. By incorporating the instructional development procedures evolved in the earlier United States Office of Education Study, these schools not only served as working models for instructional systems development for other colleges and universities in their region, but also fed back data as to the feasibility and reliability of the trial system.

Specifically, the project's objectives were:

1. To select and orient innovative institutions which are to serve as working models of systematic instructional planning which utilizes the entire range of newer media.

2. To evaluate this demonstration method of disseminating information by gathering data relevant to the adoption of the developmental system from visiting institutions.

3. To evaluate the (a) feasibility, and (b) reliability of this developmental system within institutions, first (hopefully) with a common course, and second, over other key courses.

4. To refine the system's organization and operating procedures, both in light of the above evaluation and the re-evaluation of a second trial.

5. To devise and build in a means for generating research hypotheses within the developmental system.

6. To prepare a prototype list of research hypotheses that have been generated by the working demonstration models.

7. To sponsor major symposia at DAVI and AASA conventions, the participants being members of the demonstration teams and project staff.

8. To aid the participating demonstration institutions in preparing summary presentations which capitalize on the advantages of media application.

9. To produce a summary document which (a) describes the major steps taken by the demonstrating institutions in implementing a systematic approach to instructional planning; (b) contains the final form of the developmental system; (c) includes diffusion data representing the number of visiting institutions and those which have shown evidence of system adoption; (d) offers a prescription for the curricula of substantive degree programs based upon role-task specification of system specialists; and (e) presents comparative cost data for instructional systems development at each of the demonstration institutions.

An evaluation dimension was introduced to the model trials by the assignment of several experts from outside the project to appraise changes suggested by trial outcomes and the value of the demonstration method employed for dissemination.

The overall administration of the project was the responsibility of the Coordination Unit located on the Michigan State campus. Additional advisement and guidance was obtained from a Project Advisory Committee composed of university administrators with considerable experience in the field of media innovation, instructional development, and evaluation. The findings presented in the report are arranged so as to offer perspectives of work at the individual schools and the overall investigation.

Each of the demonstration institutions describes (1) the background of two cases of course development, (2) the plan of action applied to this development, (3) the competencies of the specialists involved, (4) the actual sequence of events, and (5) the outcomes of the development activities. They also offer some conclusions derived from their experiences.

The members of the Evaluation Team offer opinions and observations on the same aspects of the development procedures, as derived from discussions with development teams, examination of audio tape recordings, and other sources of information. Their work was aimed at increasing the objectivity of the evaluation of the development model and dissemination activities across all four institutions.

The Coordination Unit report consists of generalizations and recommendations for study which should be implemented in the future. In addition, some general information is offered on the costs associated with the type of instructional development demonstrated in the Project.

CHAPTER II: METHOD

Testing A Model

The design of this study was guided by the premise that the procedures of media innovation in college courses and instructional development could be improved and disseminated through a cooperative testing program at four universities, which had history of success in such work. The object of the tests was a model of steps for media innovation in college instruction, evolved in a prior media study at Michigan State University. Figure 1 is a flow chart depicting the course development procedures and their sequence. The results of these tests were used to refine and reshape the model, as well as offer rare opportunities for assorted college authorities to gain a greater understanding of the complexities of the development problem and the competencies required.

Selection of Participants

The key to conducting the investigation on a large scale and restructed time schedule was the selection of four institutions, which met several criteria:

1. Commitment to immediately initiate a coordinated instructional development design in two academic areas, each enrolling a minimum of 500 students per year.

2. A willingness to employ the model development system in their design and to maintain appropriate information feedback records.

3. Availability of necessary specialists and personnel.

4. Agreement to conduct clinics for visiting educators.

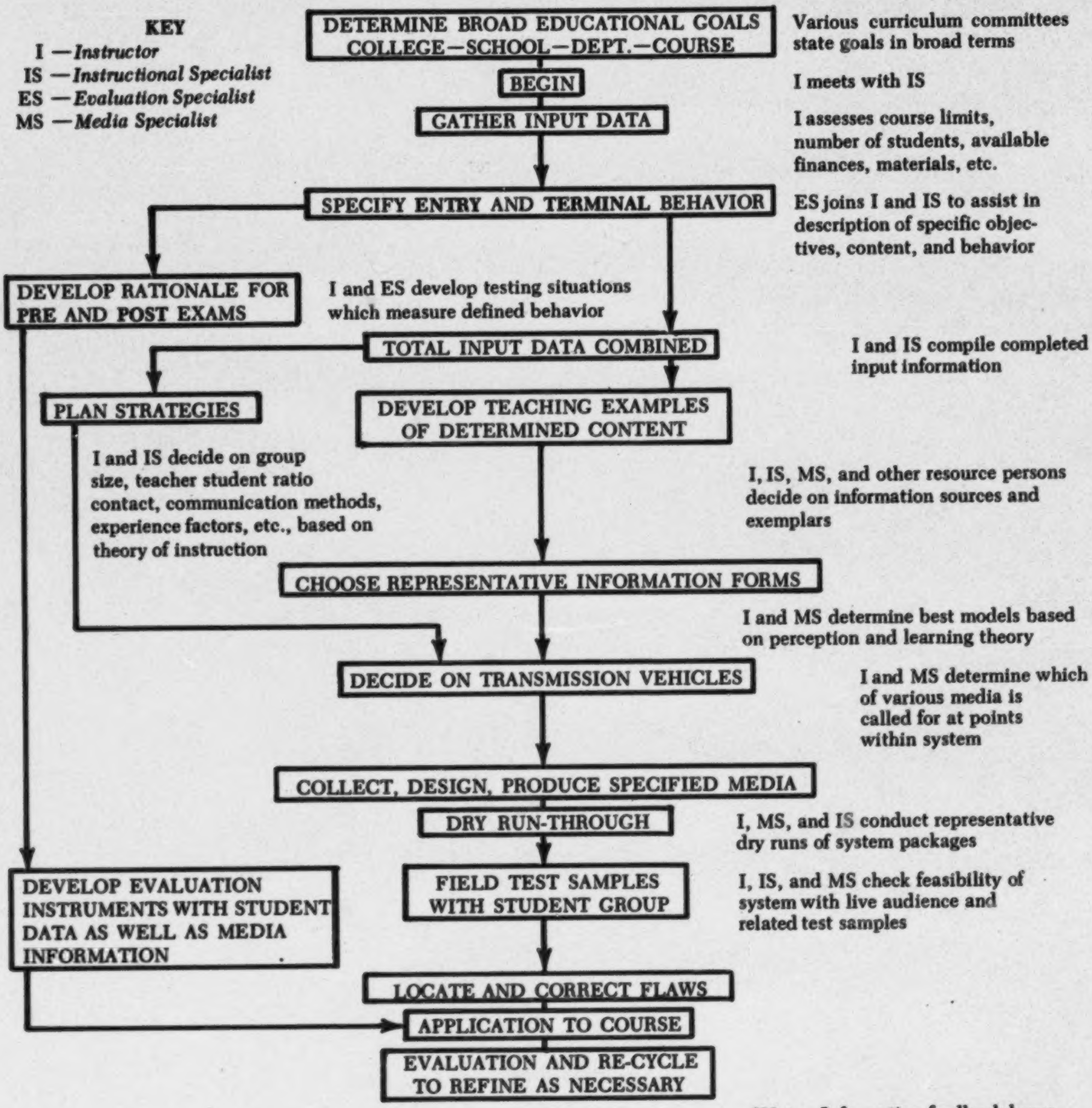
5. Central location in a national geographic region.

The lower limit for student enrollment in the courses to be treated was set to insure the selection of an instructional program which had a greater likelihood for media usage. Also, it was anticipated that large enrollment courses involved more university staff in the decisions guiding its conduct.

The investigators hoped that of the two courses, one could be in a common subject area across all four institutions. The shortness of lead time and conflicting schedules prevented this arrangement. The demonstration institutions alleviated the time limitations by selecting courses in departments which exhibited a readiness and willingness to cooperate in the development task outlined in the proposal.

Figure 1

A FLOW CHART* OF PROCEDURES FOR ANALYSIS OF INSTRUCTION AND IMPLEMENTATION OF NEWER MEDIA OF COMMUNICATIONS


KEY
I — Instructor
IS — Instructional Specialist
ES — Evaluation Specialist
MS — Media Specialist
DETERMINE BROAD EDUCATIONAL GOALS COLLEGE—SCHOOL—DEPT.—COURSE
Various curriculum committees state goals in broad terms
BEGIN
I meets with IS
GATHER INPUT DATA
I assesses course limits, number of students, available finances, materials, etc.
SPECIFY ENTRY AND TERMINAL BEHAVIOR
ES joins I and IS to assist in description of specific objectives, content, and behavior
DEVELOP RATIONALE FOR PRE AND POST EXAMS
I and ES develop testing situations which measure defined behavior
TOTAL INPUT DATA COMBINED
I and IS compile completed input information
PLAN STRATEGIES
DEVELOP TEACHING EXAMPLES OF DETERMINED CONTENT
I and IS decide on group size, teacher student ratio contact, communication methods, experience factors, etc., based on theory of instruction
I, IS, MS, and other resource persons decide on information sources and exemplars
CHOOSE REPRESENTATIVE INFORMATION FORMS
I and MS determine best models based on perception and learning theory
DECIDE ON TRANSMISSION VEHICLES
I and MS determine which of various media is called for at points within system
COLLECT, DESIGN, PRODUCE SPECIFIED MEDIA
DRY RUN-THROUGH
I, MS, and IS conduct representative dry runs of system packages
DEVELOP EVALUATION INSTRUMENTS WITH STUDENT DATA AS WELL AS MEDIA INFORMATION
FIELD TEST SAMPLES WITH STUDENT GROUP
I, IS, and MS check feasibility of system with live audience and related test samples
LOCATE AND CORRECT FLAWS
APPLICATION TO COURSE
EVALUATION AND RE-CYCLE TO REFINE AS NECESSARY

*Note: Information feedback loops have been deleted from this illustration.

Each institution designated a campus development team leader responsible for the local conduct of the study, including the dissemination aspects. This staff member also served as the instructional specialists in the development procedures. His initial responsibility was to select the best qualified persons he could obtain at his institution for the roles of evaluation specialist and media specialist in rounding out the development team.

The members of the overall project evaluation team were selected by the Coordination Unit on the basis of experience and qualifications in media innovation, instructional development, and dissemination studies.

The other participants and their relationships are depicted in Figure 2, the Project Organization Chart.

Orientation of Participants

The physical distance separating project operations made it essential to provide periodic face-to-face discussion among participants. These information exchanges were accomplished at spaced orientation and project review meetings. Whenever possible, they were held in conjunction with professional conferences at which dissemination opportunities also existed. The initial orientation meeting was conducted in September, 1965, at Michigan State and was designed to acquaint development team members with the details of instructional development activities to be undertaken at their institutions. The orientation included:

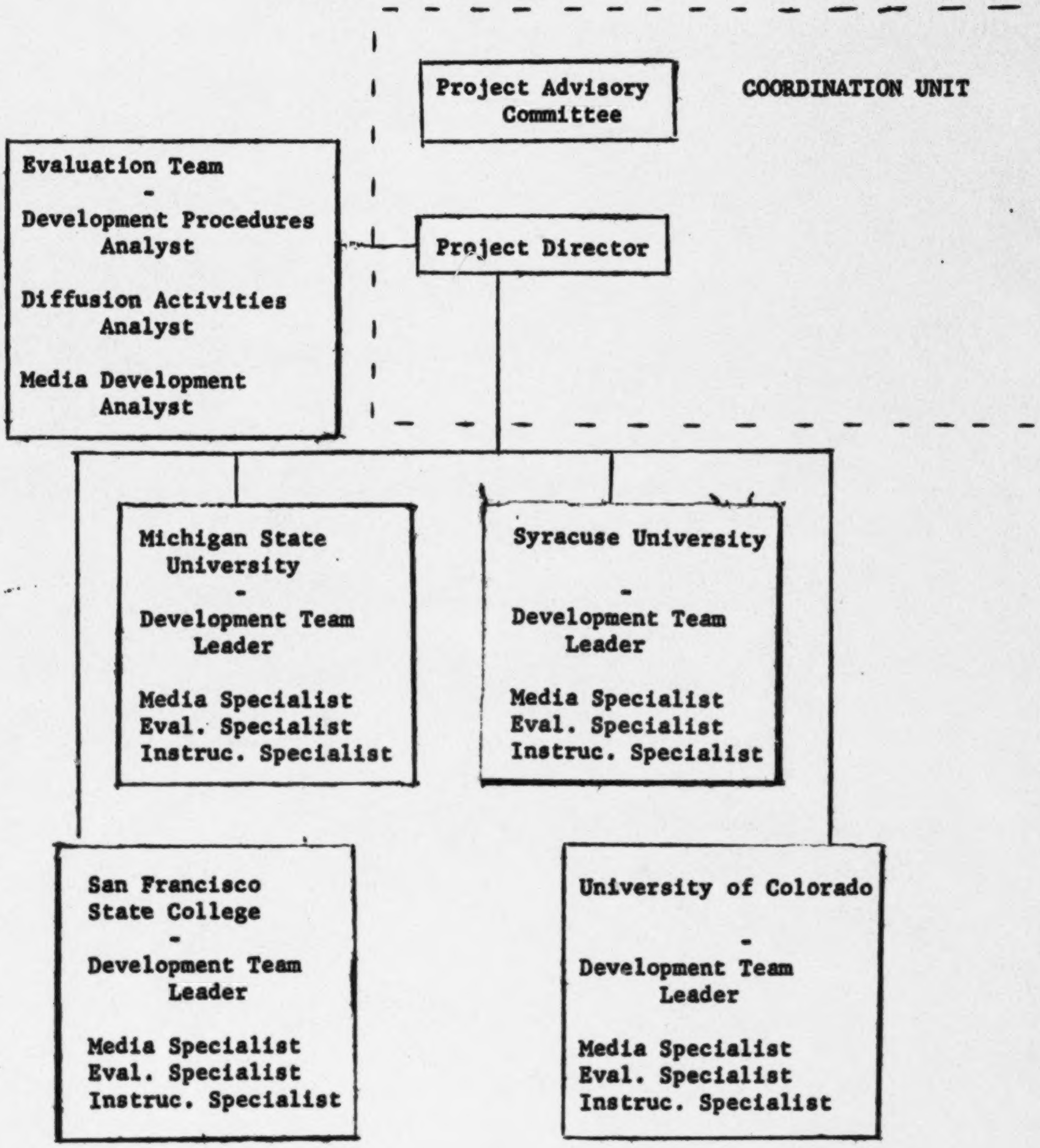
1. A presentation on the structure of the model development system.
2. A simulated run-through of the procedures, demonstrating:
   a. Specific decision points and the rationales leading to each.
   b. Instruction in the use of the information transmittal forms.
   c. The sequential nature of decision-making.
   d. Specialist's domains and functions.
   e. Use of support systems.
3. Instruction in the completion of evaluation forms to be sent to the evaluation team members.
4. Details on the administration and function of the proposed clinics and subsequent follow-up data collection.
5. The demonstration teams' role in dissemination symposia.

Figure 2
PROJECT ORGANIZATION CHART

INSTRUCTIONAL SYSTEMS DEVELOPMENT: A DISSEMINATION AND EVALUATION PROJECT

1965-1967

Instructional Media Center
Michigan State University


Project Advisory Committee
COORDINATION UNIT
Evaluation Team
-
Development Procedures Analyst
Diffusion Activities Analyst
Media Development Analyst
Project Director
Michigan State University
-
Development Team Leader
Media Specialist
Eval. Specialist
Instruc. Specialist
Syracuse University
-
Development Team Leader
Media Specialist
Eval. Specialist
Instruc. Specialist
San Francisco State College
-
Development Team Leader
Media Specialist
Eval. Specialist
Instruc. Specialist
University of Colorado
-
Development Team Leader
Media Specialist
Eval. Specialist
Instruc. Specialist

Progressive review and revision of Project activities were accomplished through meetings of development team leaders, the Evaluation Team, and members of the Advisoty Committee at approximately six-month intervals.

Analysis of Development Procedures Trials Data

The investigators regarded the transactions among specialists and faculty members participating in instructional development as the primary source of data for analysis. Collecting this information was obviously a formidable task. The most practical means for capturing the details of development appeared to be recording these deliberations on audiotape. One institution employed videotape during a limited period for later use in dissemination clinics. The recording of discussions met with few objections from faculty members and tended to remove anxieties about problems their use with faculty members might produce.

Other sources of data were: (1) summary logs kept by development team specialists on their activities; (2) progress estimate and reaction forms filled out by participants before and after each development session; and (3) reports submitted by development team leaders quarterly and at the review meetings.

The recordings of the development sessions, as any analyst of group interaction can attest, provided a virtual flood of uncoded information. Anticipating this problem, the Coordination Unit undertook a preliminary abstracting of the tapes before sending them to the Evaluation Team. The Project Advisory Committee suggested that perhaps the most significant cue for linking the progress of the development discussions to the model procedures were the questions asked. Accordingly, auditioners in the Coordination Unit reviewed each tape, making verbatin notations of questions in the sequence they were asked. Other commentary was summarized and interspresed according to time sequence. The transcriptions, tapes, and log reports were sent to the Evaluation Team members for review and analysis.

Members of the Evaluation Team were asked to study the written and taped records of development procedures and generate responses to these project concerns:

I. Measuring Procedures Effectiveness

   A. What is the feasibility of the hypothetical model for media innovation and instructional development when measured by the following criteria?

      1. General fit in university setting:

         You observe the model operating sufficiently trouble-free for the demonstration teams to judge it acceptable for general use in higher education.

2. Conditional fit in university setting:

You observe model usefullness varies considerably with the resources, skills, and "politics" of the demonstration institutions. Varying instructors and instructional situations require shifting steps in the development model sequence and changing the "mix" of specialists.

3. Unacceptable fit in university setting:

You observe the model was more of an obstacle than guide in the development activities of the demonstration teams. Much more than simple changes in the sequence of the model was required. New steps were devised and introduced.

B. What is the reliability of the model for media innovation and instructional development when measured as the degree of "consistency" in the kinds of activity generated by the operation of given steps in the model?

1. "High consistency" of outcomes:

You observe that given steps of the model generate the similar kinds of questions and development activities across institutions.

2. "Low consistency" of outcomes:

You observe given steps of the model generate almost random questions and development activities across institutions.

II. Procedure Refinement

A. Interpret Demonstration Team Experiences

1. Development step sequence:

Do the experiences of the demonstration teams suggest alterations in the hypothetical model development steps sequence?

If yes:
- a. What leads to this conclusion?
- b. Do the changes constitute a major or minor overhaul?
- c. Is the verdict for change common in all of the test institution experiences?

d. Are change recommendations for different institutions in contradiction to each other?

If no: a. What further testing or treatment of the development sequence appears necessary?

2. Develop step addition:

What new development steps are revealed by the work of the demonstration teams?

If some: a. Are the new steps related to and do they fit the present model?
- b. Are the newly revealed steps common to all four test institutions?
- c. Are any of the new steps observed in the work of different institutions in contradiction?
- d. What further testing of the new steps do you recommend?

If none: a. What rationale can you give for the lack of new step development?

3. Development step refinement:

What refinements in existing development steps were revealed by the work of the demonstration teams?

If some: a, How does the refinement differ among demonstration institutions?
- b. What appear to be the chief causes for development step refinement?
- c. Do refinements involve the deletion of any existing steps?
- d. What are the practical limits of step refinement? At individual institutions? In a generalized model?

If none: a. What reasons can you offer for the absence of step refinement?

B. Mechanism for Generating Research Hypotheses

1. What nature of methanism appears feasible from a review of the demonstration team experiences and how are the hypotheses generated?

2. How are the steps of the development process linked to the hypotheses generating mechanism?

        3. Can this mechanism or structure be modeled, either separately or within the development system model?

III. Prototype List of Research Hypotheses Resulting From Trials

    A. Are these statements most useful couched in terms of experimental propositions, or expressed in common problem descriptions?

    B. Must the hypotheses deal with the specific problem in the demonstration institutions or can they be generalized to all instructional development?

IV. Implications for System Specialists' Preparation Curricula

    A. What observations in the demonstration team experiences support the recommendations for specialist training?

        1. Evaluation Specialist?

        2. Instructional Specialist?

        3. Media Specialist?

    B. Are these recommendations reconcilable with present-day training opportunities or need new discipline be created?

    C. What role does "practical experience" play in the development of competencies of the specialists?

    D. To what extent do unexplored research areas limit the competencies of the specialists?

Dissemination Study

Concern for judging the effectiveness of the dissemination activities paralleled concern for information on the worth of the model development procedures. The investigators were curious about (1) who was influenced by the work at the demonstration institutions; (2) how they were affected, and (3) what they did about the information received. Three sources were tapped in order to obtain these measures; the dissemination experiences of the development teams, reactions of staff members on the demonstration team campuses, and parties outside the demonstration institution who either witnessed the development work or presentations of it on visits or in the clinic sessions. Appendix A contains an information collection form employed in obtaining some of this information. The Evaluation Team examined these data in offering observations on dissemination mechanics and effectiveness.

A. Demonstration Mechanics

1. Can the development model be successfully communicated to occasional "visitors" or is long-term observation required? If yes, by what means?

2. What supporting documents or displays are necessary for dissemination? Do you think the process can adequately be "packaged" for presentation?

3. What roles should the various specialists and the instructor play in demonstration?

4. Should the "display technique" employed for communication with on-campus colleagues differ from that for off-campus visitors?

B. Dissemination Effectiveness

1. Who appeared to be most influenced by the procedures demonstrations?

2. To what extent were they influenced?

3. Where do you rate the usefulness of the demonstration method for disseminating a procedural approach? What alternatives appear to be more useful?

Costs Accounting

It is nearly impossible to identify the total expenditures of time and money involved in the trials of the development procedures. Funds provided by the study project covered only part of the costs. The universities donated a good deal of faculty and specialist time and physical facilities in exchange for the benefits their overall organization would derive from project outcomes. However, in the interest of providing some idea as costs associated with instructional development, the investigators have analyzed project finances and classified time and money expenditures, including university-contributed resources, where this information was available.

CHAPTER III: RESULTS

The primary purpose of this study was to influence educators at institutions of higher education toward employing certain proposed instructional development steps in the design of instruction and the implementation of newer media.

This outcome was sought through the demonstration of model development procedures by specialist teams in actual courses of instruction at four cooperating universities.

The demonstration activities also provided an excellent opportunity to test the usefullness of the development steps across four institutions and attempt further refinements.

The results of this investigation are reported in three parts. First, both the outcomes of the demonstration activities and development procedures refinement are reported by the teams of specialists from each institution. Second, four evaluators, who were given the opportunity to intimately observe these activities, report their assessment of key aspects in the investigation. Finally, the Project Coordinating Unit reports the approximate costs of the four cases of instructional development. The specialist teams summarize their work in the following respects:

Report of Demonstration-Development Activities

1. Background of instructional development problem
2. Steps of instructional development employed
3. Competencies of the development specialists involved
4. Outcomes of the development activities
5. Unresolved issues of instructional development

Conclusions Derived from Demonstration-Development Activities

1. Comparison of kind and sequence of development steps employed with those stated in hypothetical model.
2. Estimate of the generalizability of developmental model to other higher institutions pursuing instructional development.

Project evaluators observed specialist teams' progress by reviewing audiotapes and logs of the development activities and periodic discussions with team members. They report their observations in the following four papers:

1. Analysis of the Data Secured on Actual Development Procedures - Dr. Phil C. Lange.

2. Heuristics of Media Implementation in Instructional Systems Development - Dr. John B. Haney.

3. Usefulness of the Development Model for Generating Research Hypotheses and Specifications for Specialist Training - Dr. John M. Gordon.

4. Dissemination Value of the Demonstration Approach - Dr. John Childs.

Recognizing the importance of cost guidelines to augment those offered in the earlier instructional development, "A Procedural and Cost Analysis Study of Media in Instructional Systems Development," the Coordination Unit reports, in the final portion of this chapter, development costs estimated by each specialist team.

REPORT: UNIVERSITY OF COLORADO

BOULDER, COLORADO

INSTRUCTIONAL DEVELOPMENT TEAM

Dr. Robert de Kieffer, Team Leader

Dr. Keith Davis, Evaluation Specialist

Dr. Donald Darnell, Instructional Specialist

Dr. Louis Brown, Media Specialist

INSTRUCTIONAL DEVELOPMENT ACTIVITIES REPORT

UNIVERSITY OF COLORADO

Background

At the beginning of the sub-contract negotiations, it was hoped that all institutions involved in the Instructional Systems Development Project would attempt to concentrate their efforts and energies in two curricular areas; namely, Speech and Business. As a result, immediate contact was made with the Department of Speech and Drama and the School of Business. Both of these areas were interested in becoming involved in the project at the University of Colorado.

The courses selected for study and analysis were (a) the Freshman English taught by the Speech faculty, (b) Business Statistics and, (c) Business Management. A course in Business Communications was investigated, but due to a resignation by faculty that occured right after our initial discussion, this endeavor was dropped.

(a) The Freshman English course at this University consists of approximately a hundred sections. Four of these sections were taught by the faculty from the Speech and Drama Department. There existed a concern, particularly for the said four sections, to improve the course. With the approval of the Department Chairman, the ISD model was applied by the University of Colorado Project Team.

(b) The Dean of the School of Business discussed the project with the University of Colorado Team. The Statistics course was deemed to present inherent problems as to the nature of the content. With the agreement of one faculty member concerned, the team applied the model to this course.

(c) The interest in the School of Business spread to the faculty, particularly one man, of the Department of Production and Manpower. With this expressed interest, exploratory sessions were held with the faculty and chairman of this Department.

Plan of Action

In the case of the English course, the plan of operation evolved so the team worked with one faculty member (who happened to be on the team). He in turn served as liaison with the other three members of the group. The model was followed in the basic format developed at M. S. U. This model was modified as the result of this endeavor and noted in the following paragraph.

For the Statistics course, the team contact worked primarily with one member of the faculty that taught this course. The liaison between the team and other faculty members has been incidental. The modified model has been employed with this course.

With the Management course, the team has worked with four of the five faculty members teaching this course, including the Department Chairman. The modified model has been followed.

Specialists

The team at the University of Colorado has consisted of four members, i.e., Dr. Robert de Kieffer, Director; Dr. Louis Brown, Coordinator and Media Specialist; at present Dr. Keith Davis, Evaluation; and Dr. Donald Darnell, Learning.

The University of Colorado team has consistently operated a group in each case. These have been of great value because each member makes contributions from his own background regardless of his assigned role. Both de Kieffer and Brown have extensive background in curriculum organization and therefore have made helpful suggestions in the area of teaching strategies.

The Learning Specialist has stated that a person with a broader background in learning theory and educational psychology might better round out the team.

Sequence and Outcomes

(a) The work with the English course was our first endeavor.

The Michigan State University model and the University of Colorado modification that evolved were applied step by step with recycling occurring as the need arose.

Several sessions were devoted to the identification of objectives. The approach was to concentrate on student behavioral objectives and Robert F. Mager's book, "Preparing Objectives for Programmed Instruction" became a helpful guideline along with Benjamin S. Bloom's, "Taxonomy of Educational Objectives."

Since this course had objectives in terms of the student ability to make an oral presentation, two basic types of media were employed.

1. Overhead transparencies to illustrate communications concept and outlines of classroom presentations.

2. Video tape and 8mm film were employed to observe student presentations and for evaluation by students as well as faculty. Due to the limitations of 8mm equipment, the video tapes were better accepted and of course allowed for immediate playback. A planned combination of the two media would perhaps have been a more desirable approach.

The activity of the team with the ISD model led to complete revision of the English course as presented by the Speech Department. This course, while no longer being taught in the English Department, is now being offered as the basic Speech course in the Department of Speech and Drama.

(b) The Statistics course was the second course to be phased into the project.

The revised model was followed step by step. When we arrived at the point of developing teaching examples, it became clear that there were not good textbooks or reference available which were consistent with the stated objectives of the course. The decision was made at this point to develop a basic manual for this course. Two different approaches in the preparation of this manual were made. One was written in a more traditional style and the other was developed along the lines of a programmed text. These two manuals will be compared for effectiveness with students.

Several transparencies were developed for classroom presentation. These have yet to be evaluated.

One of the most significant developments with this course was a concerted attack on determining the background and achievement of students. Students' background data is being correlated with test results in the course. It is hoped that as a result of this phase of the study a more realistic prognosis can be made of the probable success of individual students prior to enrollment in the course. Coupled with the faculty evaluation, a laboratory session is being designed to provide supervised learning experiences for those students who have difficulty with the content as determined by classroom and/or study assignments.

Classroom presentations have yet to be resolved.

(c) The Management course has been the last course to be involved in the project. As noted above, the team is working with four faculty members who teach this course. More time was thus required to arrive at a concensus concerning objectives, but at this writing there is apparently a greater understanding of the objectives by each of the faculty members.

This group is at the stage of developing teaching strategies. The approach currently contemplated is to consider the student perception of the course, and the faculty's perception in relation to the major content areas. Details of classroom presentations have not been resolved to date.

In every instance, evaluation of the "change" will be a continuous process.

The Team

The University of Colorado Development Team has found the better procedure is to have the team of specialists meet as a group with faculty members who become a part of the larger team, and to work together as a team for the sole purpose of the improvement of instruction. The team involvement is needed at all policy or decision-making sessions, but the follow-through, such as the production or the testing, is decided upon the responsibility of the appropriate specialist.

The role of individual members of the team of specialists, including the faculty participants, should not be finite. The competencies of each member will "come to the top" of the discussions as the need arises. This, in no way, implies that competencies for evaluation techniques, curriculum organization and learning principles and the media field are not needed. They are just not emphasized and distinguished as such by the team members. This has encouraged our team members to develop knowledge and confidence in each other. This approach has also built confidence on the part of faculty participants since they do not identify individual gains to be anticipated by a particular specialty, i.e., "empire building."

This team approach keeps each member abreast of decisions and outcomes. Thus, the time needed to "fill in" or "up-date" a member is eliminated. Variations of possibilities and expressions of personnel opinion need not be gone over several times because of an absent colleague. The dangers of receiving misconstrued information about the activities of the team, including faculty members, is greatly reduced by this face-to-face confrontation of all the people involved.

Common knowledge tends to increase rapport and to build confidence.

This team approach has evolved a variation not previously encountered with the other institutions in the overall project.

The development of strategies by the team for pursuing the model with a given faculty has proven most worthwhile. The Colorado team has found a need for the team to discuss among its members the faculty personalities involved; the problems within the courses and ways to solve them in light of these personalities and the history of the courses.

These "staff" sessions not only provide direction for the team members but provide for deeper consideration of the course content, strategies, and learning problems. It is often difficult or detrimental to freely discuss problems with the faculty present, particularly if such discussions pertain to the teaching techniques or mind set.

The Model

The Colorado team determined early in its involvement with the M.S.U. model that the model in its original term contained too many operations or steps for practical purposes. As a consequence, the Colorado modified model (see Figure 3 , p. 21) was developed and applied. The modified Colorado model is the result of combining several steps in the original Michigan State model.

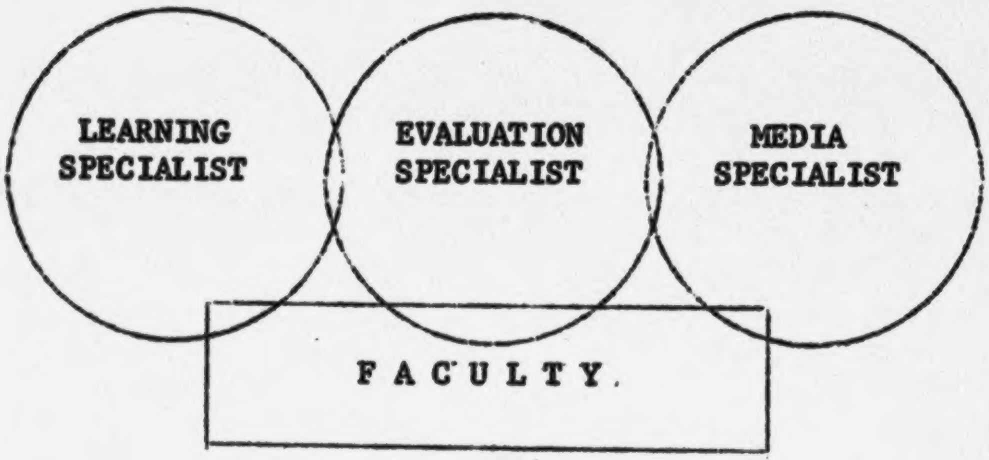
The modified (simpler) model was used to give direction for faculty members. After exposure to this organized approach, the faculty members knew what was involved and became more cooperative. (With a formal Educational Development Program, this direction is implied and the exposure of a model of procedure would be less needed.)

It has been our experience that faculty members do not, or are reluctant, to respond to a lock-step fashion. The nature of the steps in the Michigan State model overlap to such a degree that it is inconvenient, even detrimental, to try to isolate them in practice. We have found the broader categories of the modified Colorado model allow enough flexibility to be usable and at the same time it retains a systematic approach.

The development of teaching examples per se has a tendency to be extraneous. This step appears to be more attainable when the examples are actually developed as a natural outcome of arriving at an organizational and teaching strategy. The Colorado model might thus be reduced in steps so that examples are included within the strategy.

Figure 3.

Revised Instructional System Development Model
Employed by the University of Colorado Specialist Team


LEARNING SPECIALIST
EVALUATION SPECIALIST
MEDIA SPECIALIST
FACULTY

R 1. Determine Inputs

E 2. Defining Operational Objectives

C 3. Plan Overall Strategy

Y 4. Develop Teaching Examples

C 5. Develop Behavorial Exams

L 6. Locate, Select and Produce Materials

E 7. Dry Run

8. Wet Run

It should be noted that the Colorado model attempts to combine steps for practical application. We have not attempted to eliminate steps for the team of specialists as such, but rather to incorporate separate steps into broader categories for faculty members. In this respect, the Colorado model is the Michigan State model with only broader headings identified. The definition of these broad headings are the more detailed steps of the Michigan State model. In a sentence, the Michigan State model provided the background for the team. The Colorado modification provides the systematic arrangement of areas of concern by which a larger team of specialists and faculty can by guided. The "dry run" step in both models has yet to be tested as a necessary part of the model. We have simply not found the time to pursue this step adequately. It may have limited utility.

Reactions to ISDP at the University of Colorado

1. "Who is going to receive the reports of our discussions? The Dean?" (Typical of the concern of the faculty. One professor was offered the audio tapes being recorded for his keeping before his fear was subdued.)

2. "I was damn mad after the first couple of sessions of trying to explain objectives that I could have... Then my conscience troubled me so that I could not explain the objectives, so I decided to pursue the investigation further. I am glad that I didn't give in." (Several reactions of this variety were expressed after several weeks of meetings. The comment refers to the team's persistence in attempting to identify course objectives in behavioral terms.)

3. "I expected to have media pushed upon me." (When the application of media equipment was not discussed early in the process, this type of comment was expressed.)

4. "I would like to be able to .... Is there some way I can achieve this objective."

   "Don't we have a -------- (media) to illustrate -----------?" (After objectives had been established and queries about evaluation procedure was approached, the above references were expressed.)

5. "I have worked more hours on this project than I do at my regular job!"

6. "If I had a better selection of students and the facilities, my course would be great." (Attitude encountered from about half of the faculty involved.)

7. "This project has created more interest and enthusiasm for this course than has ever existed." (Pretty consistent remark after an introduction of a new approach to instruction.)

8. "I have never seen students so interested and attentive in this course!" (Viewing a student role-playing situation on video tape.)

9. "Kids stopped after class consistently to discuss their problems as the result of this technique!" (Class critique of student performance on film and tape.)

10. "We (faculty) need more time to develop materials for our course." (This lament was expressed in two out of three cases.)

11. "We (faculty) have discussed this to the point of redundancy. Let's move on to the next step." (Believed to be related directly to the awareness of the total system and thus a felt need to proceed.)

REPORT: SYRACUSE UNIVERSITY

SYRACUSE, NEW YORK

INSTRUCTIONAL DEVELOPMENT TEAM

Dr. Eugene K. Oxhandler, Team Leader

Dr. Kenneth Fishell, Evaluation Specialist

Mr. Milton I. Patrie, Instructional Specialist

Mr. Thomas E. Burford, Media Specialist

Miss Joan I. Novak, Media Specialist

INTRODUCTION

Syracuse University shares the concern of Michigan State in regard to growing student enrollments and the dearth of professorial talent. It too has sought new ways of meeting instructional obligations through the employment of the newer media of communications.

The following pages report Syracuse University's part in the investigations of guidelines for analysis of course instruction and implementation of the newer media. In this study an instructional specialist, or a media specialist, examines the instructor's resources and class limitations, determines his course objectives, and develops media and tests that fit the instructor's needs. These materials are tested and evaluated to determine their appropriateness. These procedures are repeated to further refine objectives and further modify the materials.

It is appropriate here to pay tribute to the excellent leadership provided the Syracuse instructional development team by the recently deceased Dr. Eugene K. Oxhandler. His depth of experience in researching the field of newer media and instructional development was critical in much of the effective work in this portion of the project investigation.

INSTRUCTIONAL DEVELOPMENT ACTIVITIES REPORT

SYRACUSE UNIVERSITY

In keeping with the parameters established by the project designers, two courses were chosen. Selection was based upon three criteria:

1. The course was of a basic nature in relation to the total program.
2. The course served a large student population (500 students per semester).
3. The willingness of the instructor to submit to the rigorous demands of the systems approach to the development of his course.

Based on these criteria, the courses chosen were Psych 5, "Foundations of Human Behavior," and CFEd. 200, "Introduction to Philosophy of Education."

Psych 5: The General Structure of the Course

Description:

> Introduction to the fundamental principles of mental life and human behavior. Significance of psychology in human relationships and self-understanding. Not open to freshmen.

The course was divided into six sections. Each section ranged from 150-250 students, including one small honors section of 25-30 students, giving a total population for the course of about 700 students per semester. Generally, Psych 5 is a one-semester course which is repeated every semester.

The Initial Teaching-Learning Situation

Since our efforts centered around Dr. Joseph Sturr, of the Psychology Department in the School of Liberal Arts, we will attempt to describe only the initial teaching-learning situation in which he was involved. Initially, Dr. Sturr's class met 3 times a week for 1 hr. The class consisted of approximately 180 sophomore students. This class size dictated that it must be held in a large lecture hall. As a result, the initial classroom was a large barnlike room, of poor acoustical design and quality, with a capacity of 200/. Initially, there were no facilities for media usage. The only facility available to the instructor was a 5 x 12 ft. blackboard, mounted on the right of the front wall. The poor acoustical quality of the room and the lack of adequate amplification facilities made lecturing most difficult, if not impossible. All too often the lecture could not be heard or understood. Although the instructor resorted to frequent use of the blackboard, information placed upon it could not be read by anyone at the rear of the room. At our request the audio-visual service department of the Center for Instructional Communications, placed an overhead projector and a large tilting screen in the room. This helped improve the situation. Although we made many attempts to make the best of the situation, it soon became apparent that this room would not lend itself to effective use of the various media available. With this in mind we decided to attempt the scheduling of Psych 5 for the multi-media classroom facility in the Newhouse Communications Center. Actual scheduling was accomplished for the second semester ('65 - '66).

Initial Contact With the Instructor

Initial contact with Psych 5 had been established through Dr. Joseph Sturr, one of the five instructors teaching the course. Dr. Sturr had previously visited the Center for Instructional Communications, seeking the development of materials for his course. Because of his purpose and his eagerness when confronted with some new media, we approached Dr. Sturr to determine his willingness to participate in the media-oriented approach to course development which our Project Model offered. He was ready and willing to assist us in investigating this program.

The Model, as is, first calls for a rigorous definition of behavioral objectives. Dr. Sturr admitted that he had had no formal training in methods of instruction. In addition, both Dr. Sturr and the media specialists lacked desired time and back up personnel to permit the called-for entry to the Project ISD Model. However, Dr. Sturr freely discussed his course outlines, notes, readings and general instructional aims, permitting us to enter the model at points involving decision-making for the production of materials. This will be further discussed under initial strategies.

Originally, we had intended to gradually involve all five instructors in Psych 5 in the development of the course. A campus survey of students'opinions about existing courses indicated that Psych 5 was considered dull, uninteresting, and difficult to digest. However, as planning sessions evolved, certain uncontrollable factors soon became apparent. The five instructors had three distinct and different ideas about course content and how it should be taught. This was primarily due to their divergent backgrounds in psychology. Two instructors considered themselves physiological psychologists, two more described themselves as clinical psychologists, and the fifth was a psycho-linguistics specialist. These unresolved instructional biases, complicating the production of specific objectives, could not be considered as a ground from which we might survey media and course development. Therefore, in order to proceed, with limited time and resources, we elected to work primarily with Dr. Sturr.

CFEd. 200: Introduction to Philosophy of Education

Description:

> An examination of philosophic issues which bear upon education. A comparative treatment of conflicting beliefs about reality, knowledge, and value is made in terms of idealism, realism, and pragmatism. Prerequisite: none, although prior work such as Philosophy 131 G (Amer. Phil.) is highly desirable.

The General Structure of the Course

CFEd. 200 is a one-semester course repeated each semester. Initially, the course met Thursday evenings for two hours each evening. A student population of about 180 had enrolled for the first semester ('65 - "66). About 85% of this population was comprised of practicing teachers enrolled for graduate work. The instructor was Dr. Thomas Green of the Cultural Foundations Department in the School of Education.

Initial Teaching-Learning Situation

The class size (100 ≠ graduates), again, dictated the use of a large lecture hall. The initial lecture hall used by Dr. Green was similar in limitations to the one used by Dr. Sturr for Psych 5. Effective use of several media was limited. Again, we were successful in scheduling C.F. Ed.200 into the multi-media classroom facilities of the Newhouse Communications Center for the second semester ('65-'66).

Initial Contact with CFEd Instructor

Anticipating the inception of the ISD Project at Syracuse University, Dr. Oxhandler personally contacted Dr. Green in an attempt to determine his interest in participating in the project. His decision to contact Dr. Green was prompted by two beliefs. First, through his professional contacts with him, he believed that Dr. Green was keenly interested in experimenting with instructional techniques. Second, he believed that the nature of the course, "Introduction to the Philosophy of Education," presented a unique challenge to the ISD demonstration team in the application of the model and in the design and development of appropriate media. A preliminary conference with Dr. Green revealed that he was ready and willing to participate in the project. We believe that one of the major reasons Dr. Green chose to participate in the project was the anticipation of using the responder-system in the multi-media classroom, to gather data for measurement and evaluation of his instructional techniques and their influence on the decision-making process and opinions within the students.

In the initial planning sessions we attempted to induce Dr. Green to define his behavioral objectives. Dr. Green's reaction to this approach was adamant. He immediately asserted that he did not believe in stating behavioral objectives, since they were verbally apparent in his lectures. Therefore, in order to proceed, we decided to drop the subject of defining objectives and sought other entry points into the proposed project model.

Initial strategies designed and adapted for facilitating entry into the model will be discussed in detail in succeeding sections of our final report.

HEURISTICS OF INSTRUCTIONAL SYSTEMS DEVELOPMENT ACTIVITIES

The following portion of the final report is a relation of the heuristics of instructional systems development activities, as they evolved at Syracuse University. We have attempted to express these heuristics as they relate to the application and implementation of the hypothetical ISD model. These heuristics are suggested solutions to the problems that arose during our activities in course development.

PREPARATION FOR INSTRUCTIONAL SYSTEMS DEVELOPMENT ACTIVITIES

Upon receipt of the sub-contract, the demonstration team leader, Dr. Eugene K. Oxhandler, selected an evaluation specialist and two media specialists. This specialist team then analyzed the ISD model in terms of the roles and functions of the team members. Who was going to do what? It was apparent that we had to determine the "What". Therefore, we analyzed the specifications written into the project, looked at the model again, and reduced the "what" in the model to a set of basic operational objectives. Underlying these objectives was the assumption that these are the kinds of functions and activities that a development team must pursue in order to facilitate the selection, production, and implementation of media in course development. This concept is, of course, predicated on the initial decision that our approach to course development activities was to be media-oriented. This set of operational objectives may be expressed as follows:

> The basic objectives of the development team will be to assist the instructor when requested, in.........
>
> 1--specifying the general educational goals for the course
>
> 2--specifying his specific objectives for the course in terms of the exiting or terminal behaviors of the learner
>
> 3-- specifying the students' entry behavior

4--specifying content

5--developing rationale for pre and post exams

6--developing evaluation instruments with student data as well as with media information

7--combining and analyzing total input data, (i.e., data gathered via activities 1-6 above)

8--planning overall strategies

9--developing teaching examples of determined content

10--choosing representative informational forms, (i.e., developing information models based on perception and learning theories)

11--selecting appropriate transmission vehicles, (various media)

12--developing the instructor's skills in the methodology of various media, (both hardware and associated soft- ware)

13--evaluating and refining the instructional packages produced.

It should be noted here that the phrases "to assist" and "when requested" are the keystones in implementing these operational objectives at Syracuse. We were and are not in a position to "force" the instructor to accept these services. On the other hand, we were and are obligated to bring to bear every possible influence available which might elicit a "_felt_ _need_" that will lead the instructor to request such services. In some instances the instructor could accomplish many of the functions implied in these operational objectives without resorting to the services of the development team.

Once these operational objectives had been specified, the team members' responsibilities were delineated. The role and function of each team member was originally established as follows:

---the evaluation specialist would assist the instructor in accomplishing objectives 1, 2, 3, 4, 5, 7, 8, and 13

---the media specialists would assist the instructor in accomplishing objectives 7, 8, 9, 10, 11, 12, and 13

Note that both the evaluation specialist and the media specialist have a mutual responsibility: to assist the instructor in accomplishing objectives 7, 8, and 13. These specialists may work together, in aiding the instructor and accomplishing a specific objective, or independently of each other. Delineation of role and function satisfied the need to know "who was going to do what?"

"What courses shall we involve?" was the next question that had to be answered. The answer to this question was, in part, predetermined by the course criteria set by the project designers. We believe an equally important factor hinged on identifying faculty members who demonstrated an interest in media and/or course development. We attempted to meet all of the predetermined criteria for course selection, as specified in the project agreement. However, we placed precedence on the instructor's demonstrated interest in media and course development activities. The events that led to the ultimate selection of the instructors were described in the section of this report dealing with the background of course development problems.

Actual course development activities commenced when initial contact was established between the course instructors and the development team. This initial meeting was scheduled by the team leader. It was designed to establish a working relationship between the team of specialist and the instructor. During this meeting the instructor was introduced to the members of the team and appraised of the role and function of each specialist. At this meeting preliminary planning sessions were scheduled. The demonstration team decided to initiate the data-gathering process during these preliminary planning sessions.

GATHERING INPUT DATA

The first preliminary-planning session was devoted to collecting basic input data concerning the nature and scope of the courses, including:

---course objectives

---general objectives

---number of students

---available finances

---materials available

---classroom facilities

This preliminary session progressed well and we were able to delineate some general objectives for the courses. The data gathered at these preliminary planning sessions provided a basis for formulating initial strategies for course development activities.

INITIAL STRATEGY

Initial Strategy for Course Development Activities: PSYCH 5

Originally, the development team decided that developmental activities for this course would grow, primarily, out of course development planning sessions. These prior planning sessions were designed to be directive in nature. During these sessions the development team would assist the instructor in moving through each phase of the development sequence as reflected in the hypothetical model. However, it soon became apparent that this was a very time-consuming process. The instructor involved had not been provided with release time to pursue these activities, and he was carrying a full instructional load. This, of course, made it impossible for him to devote the necessary time to pursue this approach to course development. In addition the instructor was convinced that developmental activities could proceed without detailed statements of specific objectives for content and students' entry and terminal student behaviors. He was, however, quite willing to allow the development team to seek out these objectives, as long as the search did not place excessive demands on his time. The instructor's time was a critical factor in our consideration of new strategies in implementing developmental activities.

With this in mind the developmental team sought other entry points into the model. Though Psych 5 was part of a continuing instructional program, the development team decided that the instruction in this ongoing course would reflect the instructor's current philosophy regarding the content and objectives of the program. In addition it was decided that the ongoing instruction would also reflect "teaching examples of determined content" and "representative informational forms". These concepts provided us with new entry points into the model.

Strategies Devised to Facilitate Course Development Activities for CFEd. 200

The approach to CFEd. 200 deviated from the set pattern implied in the hypothetical ISD model. Permission to deviate from the prescribed procedure had been pre-arranged by Dr. Oxhandler with Dr. John Barson. The initial approach was observation-oriented. This decision was based on prior experience in developing media for a course in statistics. The development activities in this situation were based on class observations. The resultant media generated proved to be both appropriate and useful. Therefore, we believed the "observation-verification" technique would facilitate implementation of the model, particularly in a situation in which the instructor is not provided with released time to pursue development activities. This belief has been confirmed in the light of our experiences with facilitating course development through selecting, adapting, and designing appropriate media.

This observation-oriented strategy involved two interdependent, concurrent phases. The first phase was to observe every lecture of the ongoing instruction and to analyze the associated materials and data generated by the instructor and his students. These observations and analyses were made by the media specialists. The observations were designed to identify and record evidence of:

----course content

----behavioral objectives

----teaching examples of determined content

----representative informational forms

----instructor's repertoire of teaching methods

----areas where various media would facilitate instruction

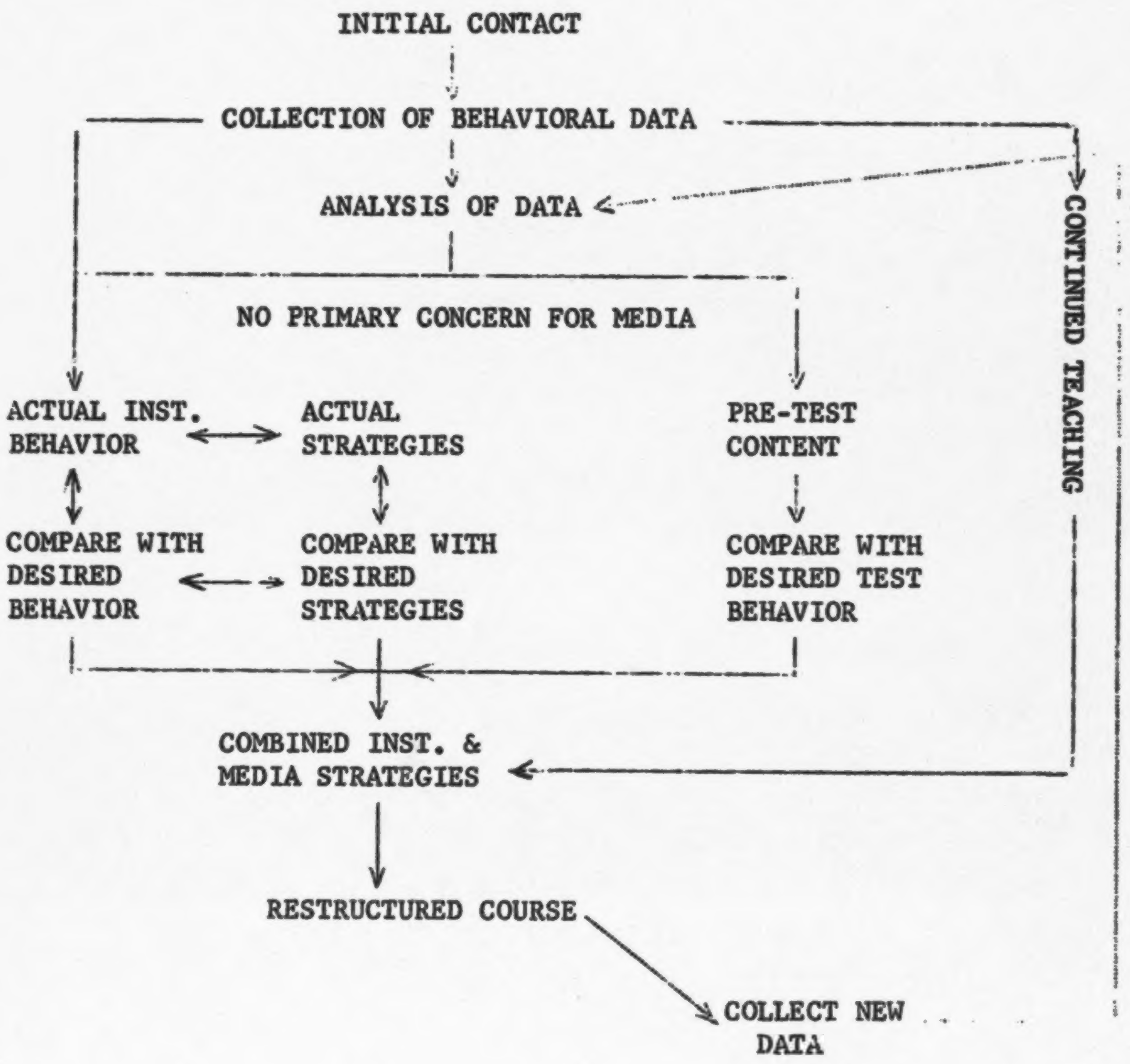
----possible transmission vehicles

The second phase of this observation-oriented approach involved presenting the observations and analyses to the instructor. This was accomplisyed during weekly discussion-planning sessions. The purpose of this phase was to validate our observations. Did they accurately reflect the instructor's objectives in terms of content and the desired terminal behavior of the student? If they did, they could be used as a basis for decisions concerning "transmissions vehicles" and recommendations for the ultimate "collection, design, and production of specific media". If they did not, the ensuing discussion usually shed light on what the instructor had originally intended. The flow of events in this revised approach are depicted in Figure 4, on page 34.

Figure 4.

Revised Instructional System Development Model
Employed by Syracuse University Specialist Team

INSTRUCTIONAL SYSTEMS DEVELOPMENT MODEL


INITIAL CONTACT
COLLECTION OF BEHAVIORAL DATA
ANALYSIS OF DATA
CONTINUED TEACHING
NO PRIMARY CONCERN FOR MEDIA
ACTUAL INST. BEHAVIOR
ACTUAL STRATEGIES
PRE-TEST CONTENT
COMPARE WITH DESIRED BEHAVIOR
COMPARE WITH DESIRED STRATEGIES
COMPARE WITH DESIRED TEST BEHAVIOR
COMBINED INST. & MEDIA STRATEGIES
RESTRUCTURED COURSE
COLLECT NEW DATA

This observation-verification method proved fruitful and provided the basis of all developmental activities that have generated media packages to date.

New Strategy Devised to Facilitate Course Development Activities for PSYCH 5

Based on our experiences with the initial strategy devised to facilitate course development activities for PSYCH 5, as outlined above, we soon "felt the need" to change strategies. By the end of October, we had made very little progress in attempting to follow the model "as is." At this point the decision was made to shift our strategy towards the "observation-verification" approach as specified for the CFEd. 200 course.

As time progressed, visable progress was noted in the form of appropriate media generated. As a result we soon adopted the same "observation-verification" strategy for both courses.

COMPETENCIES OF SPECIALISTS INVOLVED

The following specialist personnel has been involved in the ISD Project:

1. Dr. Eugene K. Oxhandler
2. Dr. Kenneth Fishell
3. Mr. Cyril Koch
4. Mr. Milton Patrie
5. Mr. Thomas E. Burford
6. Miss Joan I. Novak
7. Mrs. Diane Oxhandler
8. Mr. Charles Bidwell
9. Mr. Richard Muller

Personnel: Backgrounds and Major Contributions to Project

1. EUGENE K. OXHANDLER

Capacity: Director

Academic Training: B.S. in Ed.-Art Ed., Teachers College, Columbia University, 1944; M.A., Fine and Industrial Art, Teachers College, Columbia, 1945; Ed.D., Art and Audiovisual Education, same, 1954.

Teaching Experience: Associate Director, Center for Instructional Communications, Research, Teaching, Advisement, Administration, Syracuse University, 1960; Assistant Professor, Research, Training, Advisement, Pennsylvania State University, 1957-1960; Associate Professor, Teaching, Advisement, Administration Head-Art Department, Director of AV Education, Director Film Libraries, State Teachers College, East Stroudsburg, Pennsylvania, 1953-'57; Teaching of Art and Industrial Art, Advisement, Administration, Director of AV Education, Manager of Cooperative Film Library, State University College of Education, Oneonta, N. Y., 1948-'53.

Publications: A Computer Simulation of a Statewide Film Library Network: A Feasibility Study for Actual Operation, Syracuse, New York, Final Report USOE Project No. 5-0272, Contract No. OE-5-16-024, Sept. 1966 with Fred Christen, 47 pp.; The Three "R's" Plus O.R. -- A Systems Approach to Educational Problems, with Eleanor Taylor, USOE Contract No. OE-3-12-412, Syracuse, New York, 1964, 186 pp.; The Findings of Research on the Newer Media of Instruction, Council for Administrative Leadership, N. Y. State Education Department, June, 1962; New Systems for Education Suggested by Operations Research, Communications "Convocation Review," N. Y. State Education Department, January, 1965; Bringing the "Don's" Up-to-Date--A New Approach to an Old Educational System, AUDIOVISUAL INSTRUCTION, October, 1963, 5 pp.; New Trends in AV Teacher Education, with G. M. Torkelson, AUDIOVISUAL GUIDE AND EDUCATIONAL SCREEN, December, 1960; Can Subliminal Stimuli Teach? AUDIOVISUAL COMMUNICATIONS REVIEW, May-June, 1960; A Report on Six Research Studies, AUDIOVISUAL COMMUNICATIONS REVIEW, May-June, 1960, and others.

Professional Organizations: NEA; Department of AV Instruction; Association for Higher Education; American Educational Research Association; Kappa Delta Pi; PDK, American Association of University Professors; International Council for Research on Visual Information, Milan, Italy; Educational Research Association of New York.

Major Contributions to Project: Provides leadership and direction to the demonstration team. He advises the principal researcher in matters of administrative and financial decision-making.

2. KENNETH N. FISHELL

Capacity: Evaluation Specialist

Academic Training: B.S., Education M., Education D. in Curriculum, 1964, University of Rochester.

Teaching Experience: Assistant Professor, University of Rochester, 1961-1965; Research Assistant, University of Rochester, 1959-1961; Principal, Rush-Henrietta Schools, Henrietta, New York, 1956-1959; Teacher, Rush-Henrietta Schools, 1955-1956; Teacher, Newark Public Schools, 1952-1955.

Research Experience: Coordinator of Educational Media Laboratory for Inter-University Project I (Ford Foundation Experimental Project in Teacher Education). Consultant with several Rochester area schools on research in programmed instruction. Consultant with New York State Demonstration Project in Mental Retardation. Consultant with local Rochester industries on research.

Publications: Author of articles on research in mental retardation and programmed instruction.

Professional Organizations: PDK, AAUP, AERA, NEA, DAVI, NSSE, NCME, AAAS, ASCD, and local and state branches of these organizations.

Major Contributions to Project: Advises the demonstration team in matters of design of evaluation instruments and the collection of evaluation data.

3. CYRIL M. KOCH

Capacity: Research Assistant

Academic Training: B.A., City College of New York, 1953; M.A., University of Michigan, 1962; Ph.D., Syracuse University, 1965.

Teaching Experience: Course Programmer, Center for Instructional Communications, Syracuse University; Elementary School Teacher, Ardsley, New York; Director of Lighting and Sets for TV Production, University of Michigan; Research and Production Assistant on two series of Regents Educational TV programs, WPIX Channel 11, New York.

Research Experience: Co-author and producer of Say What You Mean, feature presentation of the Demonstration Center, Hall of Education, New York World's Fair; Currently studying the comparative effectiveness among high and low IQ students of a short TV series and two-sound-filmstrip versions of that series.

Professional Organizations: DAVI

Major Contributions to Project: Mr. Koch was the principle researcher of demonstration team ('65-'66). He developed and implemented initial strategies in the application of the ISD model.

4. MILTON I. PATRIE

Capacity: Research Assistant

Academic Training: B.S., SUNY College, Buffalo, New York, 1951; M.S., Indiana University, 1952; NDEA Educational Media Institute at Syracuse University, Summer, 1965; currently engaged in doctoral study at Syracuse University.

Teaching Experience: Lecturer, Educational Media Institute, Syracuse University, Summer, 1966; Audiovisual Instructor, Greenwich (Connecticut) Public Schools, 1961-'65; Instructor, Central Connecticut State College, Summer, 1960; Assistant Professor, University of Maine, 1957-'59; Assistant Professor, Western Illinois University, 1956-'57; Elementary Teacher, Los Alamos (New Mexico), Public Schools, 1954-'56.

Publications: Author of articles on preparation of visual materials and viewing standards for projection; contributor to research abstracts.

Research Experience: Research Assistant, Instructional Systems Development: A Demonstration and Evaluation Project, 1965-'66; consultant with Niskayuna Public Schools on Individualized Instruction, 1966.

Professional Organizations: Phi Delta Kappa, DAVI, NYSAVC.

Major Contributions to Project: Mr. Patrie was responsible for design and production of media developed for courses ('65-'66). Presently acting as coordinator of project developmental activities.

5. THOMAS E. BURFORD

Capacity: Research Assistant

Academic Training: B.A., SUNY, Buffalo, 1957; Ed.M., SUNY, Buffalo, 1964; NDEA, Educational Media Institute at Syracuse University, Summer, 1965; Graduate of Empire State Military Academy, Officers Candidate School, Commissioned Officer USAR & NYARNG, 1958; currently a Ph.D. candidate in Educational Communications Media, Syracuse University.

Teaching Experience: Teacher--AV Coordinator, Depew School System, Depew, New York, 1957-'58; Teacher--AV Coordinator, Lewiston-Porter Central School, Youngstown, New York, 1958-'60; Director of AV Education and Teacher, Lewiston-Porter Central School System, Youngstown, New York, 1960-'66; Instructor, ESMA-OCS, Branch School, Syracuse, New York, 1966.

Research Experience: Background in research methods through graduate work; i.e., courses in The Experiment in Education, Design, and Evaluation, Problems in Educational Research (Research Readings).

Professional Organizations: PDK, DAVI, NYSAVC, NYSTA, and local branches of these organizations.

Major Contributions to Project: Mr. Burford assumed the position of principle researcher in the project in September, 1966. He is now responsible for continued development and implementation of strategies which facilitate the application of the ISD model in course development. ('66-'67).

6. JOAN I. NOVAK

Capacity: Graduate Assistant

Academic Training: B.S., SUNY College, Albany, New York, 1961; MSEd., SUNY, Potsdam, New York, 1965; English Institute study at St. Lawrence University, Canton, New York, Summer, 1962; currently engaged in doctoral study at Syracuse University.

Teaching Experiences: English teacher, Gouverneur Junior High School, New York, 1961-'64.

Professional Background, other: Counselling as welfare caseworker, Jefferson Co., New York, 1964-'65.

Professional Organizations: DAVI

Major Contributions to Project: Miss Novak assisted principle researcher in developing and facilitating the implementation of course development strategies, (1966-'67).

7. MRS. DIANE OXHANDLER

Capacity: Dr. Green's Graduate Assistant, 1965.

Academic Training: B.A., Wilanette University, Salem, Oregon, 1957; M.A., Syracuse University, 1963; currently engaged in doctoral study at Syracuse University.

Teaching Experience: English Teacher, Secondary School, Oregon, 1959-'61; Substitute Teacher, New York State, 1963.

Professional Organizations: John Dewey Society, and Philosophy of Education Society.

Major Contributions to Project: Mrs. Oxhandler was Dr. Green's graduate assistant and, in this capacity, was able to contribute valuabel insights into;

Dr. Green, "the man," (personality, attitudes, and opinions), and course content. This was invaluable in formulating strategies we could use when working with Dr. Green.

8. CHARLES BIDWELL

Capacity: Production specialist

Academic Training: B.A., McMaster University, Hamilton. Teachers College, Ontario, Canada, 1959; Permanent Teaching Certificate, same, 1960; B.Ed., University of Toronto, 1964; MSEd., Syracuse University, Syracuse, New York, currently being completed.

Teaching Experience: Elementary School Instructor, three years, Hamilton, Ontario, Canada; Elementary School Assistant Principal, two years, Hamilton, Ontario, Canada.

Professional Organizations: PDK, OPSMTF (Certified Teacher, Ontario Public School Men Teachers Federation). DAVI, CAVA (Canadian Audio-Visual Association).

Major Contributions to Project: Assisted in the design and production of media developed for courses.

9. RICHARD MULLER

Capacity: Computer Programmer

Academic Training: B.A., Psychology, Amherst College, Massachusetts, 1964; currently engaged in doctoral study at Syracuse University, New York.

Teaching Experience: Lecturer in Media I and Media II courses, Department of Education, Center for Instructional Communications at Syracuse University, during 1964 and 1966; Instructor in Production Methods for TV in Summer Institute for Media Specialists 1965, and in Computer Programming for same, summer Institute of 1966.

Publications: Articles on Computer Programmer Systems for and about CAI.

Research Experience: Currently an NDEA Research Fellow at Syracuse University

Professional Organizations: PDK, Alpha Epsilon Rho, DAVI, AERA, and ACM.

Major Contributions to Project: Mr. Muller is presently developing computer programs for use with the responder system-computer hookup in the multi-media classroom. The computer programs are being designed to provide the instructor and the student with almost immediate feedback of a detailed analysis of test results.

CONCLUSIONS DERIVED FROM INVESTIGATION OF INSTRUCTIONAL DEVELOPMENT AND MEDIA IMPLEMENTATION

Generalizability of the Development Model: ISD Model "As Is"

Implementation of course development, through the application of the implied procedural sequence as specified in the model "as is," might best be accomplished under the following conditions:

---instructors are provided sufficient released time to pursue developmental activities

---complete prior planning of a new course, wherein ongoing instruction could not be observed

ISD Model With Some Modifications

The basic problems we encountered, in attempting to follow the model "as is," stemmed primarily from two basic facts:

(1) the instructors were not provided with released time to pursue developmental activities as specified in the model

(2) they did not "feel the need" to specify behavioral objectives

To off-set these two factors, we developed the "observation-verification" technique which provided entry into the model at several other points.

The suggested modification, therefore, affects only the implied sequential flow of events, not the events themselves. In addition, we recommend the inclusion of "Analysis of Instructor's Entry Behavior" as one of the events and/or activities in the "Gathering of Input Data." This recommendation is based on our observations that the instructor, in many instances, will need training in the effective utilization of both the hardware and software of the média generated.

Substitute ISD Model

If we were to propose a substitute ISD model, it would be primarily based on "observation-verification-utilization" of behavioral data concerning both the instructor and the students entry and terminal behaviors. We believe the media generated from this type of "combined input data" would be more appropriate to both the "Needs of the instructor" and the "Needs of the students."

REPORT: SAN FRANCISCO STATE COLLEGE
SAN FRANCISCO, CALIFORNIA

INSTRUCTIONAL DEVELOPMENT TEAM

Dr. A. Daniel Peck, Team Leader

Mr. Francis X. Moakley, Media Specialist

Dr. Freeman F. Elzey, Evaluation Specialist

INSTRUCTIONAL DEVELOPMENT ACTIVITIES REPORT

San Francisco State College

Development of Project Team

The first analysis of the Michigan State Proposal as outlined by the Director, Dr. Barson, required that a project team be organized which could provide specific skills. Personnel indicated were an administrative head to direct operations at San Francisco State College, a qualified media specialist, a specialist in evaluation and learning psychology, and a specialist in teaching organization and methodology. Assigned to the team to meet these qualifications were Dr. A. Daniel Peck, Director and Instructional Specialist; Mr Francis X. Moakley, Media Specialist; and Mr. Freeman Elzey, Evaluation Specialist.

The team was designed to operate as a group with the realization that each member of the team, while well qualified in his own special areas, was also qualified in each of the other areas to a considerable degree. The first meetings of the team considered the parameters and rationale for course selection. Prior to the first meetings with instructors, the team interviewed students and pursued the College offerings for appropriate courses. On the basis of its deliverations the team selected the courses reported below.

The Selection of Courses

Course selection was based on the following parameters:

1. The courses which were in the lower division of the College.
2. Courses which enrolled in excess of 250 students per semester.
3. Courses which were basic requirements.
4. Courses which in the opinion of students and faculty should be improved for receptivity and effectiveness.

A basic dufficulty was encountered at San Francisco State College since there are no large sections (250). To meet the 250 enrollment parameter, courses which were multiple section were examined and particularly those courses which had the largest sections. The choice narrowed to a basic Biology course. Social Science 30, and United States History. Interviews with the Deans of each of these Schools resulted in faculty recommendations and recommendations for specific sections. The team visited each of the sections suggested and interviewed each of the instructors. The unanimous selection of the team for the first try was Social Science 30, a general education course designed for sophomores and non-Economics majors which treats rudimentary elements of economics and economic theory. The course was taught by Dr. Arthur Benavie, a distinguished mathematical economist and Associate Professor in the Department.

For the second course to be selected, the History Department recommended History of Western Civilization, History 4.1, which met all of the requirements previously stated. The instructor for the second course was Mr. William Bonds, an Assistant Professor in the History Department, and an eager participant.

In addition to these courses, the Psychology Department came forward with the request that we review and recommend a systems development treatment for their basic Educational Psychology course, and the Biology Department made a strong request that the team be allowed to sit with them in course planning sessions.

Development of Social Science 30 (Economics)

The first interviews with Dr. Benavie revolved around the behavioral statement of objectives and an introduction to the general method of operation of the team. There was a considerable difficulty incurred in coming to precise behavioral definitions and dividing them into operatable sub-units. After several meetings, the team considered that more efficient use could be made of time if it concentrated on the objectives developed to that point and moved to determine some class operations. The Evaluation Specialist, the team Director, and Dr. Benavie arrived at an entry and exit measurement device which categorized the various levels and kinds of behavior outlined in the basic objectives. This instrument was administered half way through the first semester (preparation semester), at the beginning of the second semester (operating), and at the end of the second semester. Some differences were noted between the pre- and post-examinations which indicated that the objectives stated were being met to some measurable degree. Sophisticated statistics were not applied.

Certain portions of the Economics course were given special attention since students seemed to be having some difficulty in these areas. Since examinations revealed that students' knowledge of graphic language and methods was hampering their success, special attention was given to remedial measures in this area. A program of 195 frames was developed as a remediation measure. The tabular methods of the instructor utilized the blackboard to a great extent, and an attempt was made to substitute an overhead projector as a presentation tool. A series of transparencies was developed for this purpose. To facilitate easy use of the overhead projector, the room was repainted to provide a screen area 8' by 23' above the blackboard. Some difficulties were encountered in instructor acceptance of the intrusion of the overhead projector between the instructor and his class. A series of transparencies was also developed to provide a treatment of basic equation techniques as a remedial measure. Also introduced into the class as hand-out materials were specific articles written by the instructor for purposes of clarification of particular issues.

At the end of the second semester the instructor and the team considered that it might be advantageous to continue to assess some of the developments and to make additional try-outs and reorganizations of materials. This work has proceeded for a third semester and may continue during the final semester of the project.

Development of History 4.1 (History of Western Civilization)

During the second year of the project, the team began interviews with Mr. Bonds of the History Department. In the initial phases of determining objectives, the same difficulties were encountered as had been experienced in the Economics discussions. There was a considerable reluctance to come to the behavioral statement of objectives. Objectives were stated primarily in content and chronological content outline form. However, after several tries with the entire team and considerations of evaluation techniques, some beginning successes in a behavioral statement of objectives were apparent. Operating upon these and the evaluation base, the Media Specialist and the instructor have been developing course materials of a slide-filmstrip nature. Continuing evaluation techniques were devised which utilized immediate response systems in conjunction with overhead presentations. For later consideration, electronic response techniques were discussed and may be employed. As a part of the instructor assessment, closed circuit video tape recording of instruction sequences has been planned and is proceeding for the first semester. Pre- and post-evaluation techniques are being designed by the instructor in conjunction with the Evaluation Specialist. Individuation technique will include carrel study of tape-slide sequences under development.

Courses Not Selected

Among the courses not selected were the Biology and Psychology offerings. Other courses which the team were asked to consider but did not feel that they could undertake at this time were English, Humanities, and Art. It is evident that the project has created an interest in a systems development within these areas. While the team cannot work with the number of instructors who have requested assistance, they have continued to work with both Biology and Psychology in course planning activities.

San Francisco State College accepted the Instructional Systems Development Project as a challenge and an opportunity for instructional improvement. "Systems" is a strange work to apply to an activity which has always been thought of as highly personal. Our first question was whether the system can be applied to tailor the model to human characteristics operant on the individual campus.

San Francisco State College is an aggressive, dynamic, highly individualistic campus. Most of our students are actively involved in the community making a living--sometimes changing the community, and in the college getting an education as efficiently as possible. They are in a hurry and they are eager. They are ready to be involved.

Both faculty and students are concerned about the quality and method of instruction. It was important, therefore, to interpret the model to reflect rather than overwhelm their concerns.

The courses which we selected to develop were those with which both faculty and students were dissatisfied. The courses were required, frequently dull, and often not voluntarily selected by faculty.

The first instructor and course selection was made with the cooperation and the recommendation of the head of the Economics Department. The instructor chosen, Dr. Benavie, is a highly personable, effective educator--committed to his students and his discipline. While he was open to experiment, he did not want the model, or indeed any system to come between him and his students. In the development of objectives his prime concern was to infuse his students with an enthusiasm for basic economic theory. He wished to interest and involve them to the extent that they would go on to elect further study in economics.

On the surface, Dr. Benavie was an unlikely candidate for system development. His excellence did not seem to need improvement. Application of the model, however, revealed that while some of his goals were attainable, others were not being realized. When he and the team considered his planning and operation in relation to the model, the analysis showed specific areas which might be improved. Entry testing showed that his students came to him with a wide range of abilities. A significant number of students were without a workable knowledge of simple equations, the language of graphs, and ability to conceptualize tabular data. Post tests on the first semester showed that these deficiencies were not remedied during the course. The team suggested several strategies to resolve the difficulty. Programmed learning sequences were introduced on a voluntary basis for each of the areas. New methods of evaluation and feedback were developed to supplement the instructor's subjective evaluation and enhance his rapport with students.

In the inter-action with the team, Dr. Benavie developed a new awareness of:

---methods of evaluation,

---kinds of teaching strategies different from the formal lecture, and

---the potential for the use of specialists.

Because of his new awareness, he was able to comfortably modify his teaching to facilitate more effective learning for his students. His goals, too, changed to include new and specific behaviors that he could measure and that were consonant with his primary goals. Eventually, he made effective use of the programmed learning sequences developed by the team--one to provide a competency in simple equations, and another to instruct his students in a working understanding of graphs and tabular forms.

During the beginning period the team attempted to introduce media into the teaching situation. We found that it was possible for the media to have a negative effect in that it came between the instructor and his students, and only when he had carefully experimented and become comfortable at his own pace with the elements of media, did they become effective. The overhead for a time was not a panacea, but an obstacle. Eventually, it became an effective aid.

Throughout this process the team was not unaffected in the inter-action with the instructor; they began to realize a need for a more general sophistication and versatility. The media specialist became involved with evaluation; the learning specialist with both media and evaluation; and the evaluator with presentation modes.

The model itself was changed to fit the general considerations of the team and the instructor. It was obvious that in application such a model must be flexible.

In sharp contrast to the operation with economics, the history professor chosen by the team was less than secure, a neophyte instructor, although an excellent history scholar. For Bill Bonds, the model provided an excellent developmental guideline. In this case, the model and the specialists worked to help shape his professional development. The security of a structure--that is, the model-- and the assistance of the specialists were a very real support to his teaching. In this case the specialists themselves became concerned for the retention of the decision function by the instructor, and it was the specialists themselves who strove to retain and value the human elements of teaching. Together the team and the instructor moved from the content statement as an objective to behavioral statements and beyond to develop the attitudes which comprise a sense of history. He moved out of the development of data--the chronological facts of history--into a conceptual development of the larger generalizations of history. Through the visual treatment as an adjunct to lecture material, we provided him with the opportunity to stand back and look at history with fresh insight. With a trainer-tester feedback system, he was made aware of what students were thinking and the level of student involvement at any particular time. He, therefore, achieved a more personal inter-action with students. What we did was to give new dimensions to the data of history, and to the instructor, an opportunity to develop common generalizations.

Evaluation became more than regurgitation of data. Dr. Bonds' whole testing procedure was changed through the use of the model. He moved from a mid-term and final test to a constant feedback and almost daily evaluation of concept development and a final analysis of the large ideas.

With Dr. Bonds, we provided the directions for development and the structure with which to organize his work. In the final analysis of our work with Dr. Benavie, we found that we had provided him with the impetus and encouragement to move out of the medieval lecture mode so common to the university into new, dynamic, individual ways of teaching.

Effects of the Project

The project has had a significant effect on curriculum development at San Francisco State College. The procedures utilized in the Systems Development Project have been emulated in the School of Education for several classes, the Department of Nursing, and the School of Sciences. Specific curriculum revisions are occurring as a direct result of the project operations in the School of Social Sciences. Both History and Economics have actively moved toward course revision and vitalization.

In both cases, the model was an effective device. In both cases, media was used to make teaching and learning more effective. In both cases, the human values were not made subservient to hardware and system.

We consider that the Instructional Systems Development Project has been a positive influence in the college and that its techniques will continue to be used. The campus has become aware of the potentials for instructional improvement. We have demonstrated the potential of the Audio Visual services on campus. We have gained new insight into instructional organization. Most significantly, we now have at San Francisco State College a team which started out with separate specialties and has developed into a composite group which is highly competent in the areas of human engineering, and human engineering is the ultimate requisite for the improvement of instruction. Finally, we find that the term "Systems" can be applied meaningfully and effectively to the very human acts of teaching.

INSTRUCTIONAL DEVELOPMENT ACTIVITIES REPORT

Michigan State University

Background of Course Development Problems

1. Prior to entry of Instructional Systems Development Project

With rapidly increasing enrollments in Geography 204, the Geography Department has been faced with the decision of either maintaining the size of lecture sections at their present level or increasing the enrollment of the lecture section. Since there were practical and economical problems related to employing more faculty to instruct extra sections, it was decided to increase the size of the lecture sections provided that the following conditions could be met:

---instructional materials could be made available

---lecture and recitation sections could be organized more effeciently

---a greater degree of coordination among the graduate teaching assistants

The effective teaching of geography requires the presentation of certain basic concepts, most of which fall within the categories of spatial relationships and man-land relationships. To illustrate these concepts involves the taking of examples from any part of the world. Since this introductory geography course is taught concurrently by at least four different instructors - each of whom uses a distinctively different approach to the course - it was difficult to organize the course along with its instructional materials on a unified basis so that the same evaluation standards could be used on all the lecture sections during a given term. In other words, each geography instructor specialized in certain regions of the world, and therefore tended to draw his approach to the course from these regions.

In general, the background of course development problems may resolve around the fact that no deliberate strategy has been developed in the past to identify common elements for the course. Without these elements, it is difficult for these instructors to identify concepts to be taught by all. This lack of concensus probably effects the identification of objectives which could guide the instructors in organizing Geography 204 on a mutually acceptable level.

2. Entry of MSU's Instructional Development Services and the Instructional Systems Development Project

Michigan State University promotes a favorable climate for the purposable pursuit of educational change. Through the Provost Office the Instructional Development Service has been set up to guide and advise different departments in their efforts to improve courses of instruction. Because ISD's operational structure (i.e., EDP), many departments have had the opportunity to secure funds and consultant services in order that an innovative program could be tried out and then evaluated.

Prior to ISDP involvement with Geography 204, the Geography Department and ISD had been involved in communications relating to the improvement of geography. Early in October, (1965), Dr. John Dietrich, Director of Development Services at MSU, met with Dr. Sommers, Chairman of the Geography Department, to discuss the possibility of faculty members of Geography 204 working with the MSU's ISDP team. Goals for Geography 204 were discussed as well as ways in which EDP and ISDP could be of assistance.

At the present time, ISDP has produced, as well as secured, instructional materials identified as instructional needs by members of the geography faculty. Furthermore, ISDP has consulted and advised representatives of Geography 204 as to an instructional strategy which might lead to a future extension of funds by EDP for course development.

Plan of Action Applied to Problem

1. Rationale

Taking the view that people charged with educational planning will follow an orderly approach, i.e., system approach, it was thought that group planning behavior might parallel steps suggested in Ryan's System Approach to Educational Planning. That is, there might be an identified trend which follows the phenomena of a system's approach. For example, before any decisions were reached - such as a central pool for slides, overlays and maps -

geography instructors were to prepare a list of "common elements" requiring media; this would be compatible to the first four steps of the Flow Chart of Trial-Procedures for Analysis and Design of Instructional Systems Employing Instructional Media.

During March, 1966, a tentative strategy decision was reached. Certain apparent instructional materials - slides, transparencies, and folding maps which would form a common basic collection for use by the Geography 204 instructors - would be secured and/or produced while members from geography and the project would seek ways in which to derive a listing of concepts. From these concepts, instructional objectives would be selected and defined. Then the developmental team and the geography representatives could develop an instructional strategy which would identify the general conditions of learning expected for the type of learning represented by the objective.

Because of the specialized interests of different geography instructors, it is assumed that modules, i.e., standardized operational objectives employing specific media materials, explicating geography objectives would be developed. This would serve two purposes. First, flexibility would be provided so that each instructor might proceed not only at his own pace but via the area of his interest. That is, even though an instructor may approach Geography 204 from a different position, he can still use modules at the appropriate time when specific instructional objectives are required. Secondly, the use of modules would be packaged at a later date for laboratory use by students.

2. Procedures

In terms of the Flow Chart, the following activities have been identified.

Steps One through Three - gathering of input data
Step Eleven - quick fix
Step Three - gathering of input data
Step Four - specifying of entry and terminal behaviors
of course
Step Six - the developing of a rationale for entry
and terminal behaviors
Step Seven - the planning of an overall strategy
(e.g., the coordination of recitation
sections by an assistant)

Step Three - the gathering of input data in regard to decisions upon future transmission vehicles

Step Four - the specifying of entry and terminal behaviors

In brief, the following acts have been completed:

1. The "quick fix" treatment has resulted in sets of geography slides for instructors as well as a complete master set located in the Geography 204 sector of the Geography Department.

2. Several sets of overlay transparencies dealing with Europe and North America have been secured for the course.

3. A variety of transparency maps as well as folding maps have been provided.

4. During the 1966 fall semester, Dr. Matley was given release time to coordinate Geography 204.

5. A part-time clerical work for Geography 204 was arranged and financed.

6. Under the auspices of the Geography Department, assistants were charged with the equalizing of recitation work that is required for each enrollment section.

7. An EDP proposal has been submitted to MSU's ISD in order to continue the development of Geography 204 during 1967-68.

8. A strategy has been suggested to Matley as to bringing about a consensus that pertains to geography concepts.

9. Operations are underway to gather data as to students' expectations of Geography 204.

In conclusion, the overall strategy has been toward the improvement of large class instruction, e.g., slides and a master set, indexes of media materials, and an identified sub-system for coordinating Geography 204. The second phase deals with the attention directed to the recitation classes and to the instructor's opportunity to have access to modules of media resources built around identified concepts and objectives.

Competencies of Specialists Involved

The development team is viewed as consisting of the following:

---Geography Coordinator

---Learning Evaluator

---Media Specialist

---Media Coordinator

Each will be treated separately as to his role and function.

1. Geography Coordinator

His role is perceived by the others as having academic competency in geography as well as direct channels of communications with the geography instructors.

His function is to understand and diagnose the problems of his geography colleagues in order that he can interpret their problems and needs to the ISDP members. At the same time, he is charged with facilitating change with his fellow instructors by setting up and implementing organizational operations.

The Geography Coordinator is the link between the ISDP members and the instructors. The instructional strategy developed by the team is only as good as it is conveyed back to the department's instructors.

2. Learning Evaluator

His role is perceived by the others as having professional judgment in regard to identifying for each objective the type of learning required. This expectation, shared by others for the learning evaluator, does not exclude themselves from entering into this domain.

The function of the Learning Evaluator is to guide the collected descriptive information into prescriptive policies. That is, it is his function to help the Geography Coordinator identify what is to be done in order that operational plans can be set up so that at different stages of planning and development-decision phases can be formed. In other words, he enables the others to plan schedules and sequences of events so that previous elements of the instructional strategy, when tested at decision phases, maximize performance of the projected objectives.

3. Media Specialist

His role is perceived by others as to identify the nature of the unique quality of the stimuli needed. At the same time, he is expected to have knowledge of the characteristics of each medium for presenting each stimuli identified by the Geography Coordinator and the Learning Evaluator.

His function is to clarify - from what has been tentatively planned - the conditions that a specific stimuli is needed. For example, it might be that the specifications required for a particular material linked with a medium may not be sufficient for the recitation classes although it may be necessary for the large class instruction. Additional functions of the Media Specialist relate to his understanding of educational taxonomy so that he can actively cooperate with the Geography Coordinator and the Learning Evaluator in making decisions as to the special characteristics of the stimuli (e.g., verbal or nonverbal, intensity and duration of the message, movement and/or special technical effects).

4. Media Coordinator

His role is preceived by the others as transmitting production decisions to their particular destination. It is expected that he can give the others a highly reliable estimation as to when production materials - either secured or locally produced - will be available. (He and the Media Specialist are responsible for estimating cost factors.)

His function is to serve as a liaison between the Geography Department and the Instructional Media Center. (Providing and arranging media services to the Geography Coordinator is tantamount to feedback for the planning and development group.) An additional function of the Media Coordinator would be in the area of handling Procedural Evaluation Review Techniques in order that opportunities for articulating the sequence of instructional events are maximized.

In summary of the competencies involved, it is thought that the Geography Coordinator represents the "What" in terms of goals; the Learning Evaluator represents the "Why" in terms of guiding the planning and developing into operational behaviors; the Media Specialist represents the "How" in terms of under what conditions a specified stimuli should be linked with a particular medium; the Media Coordinator represents the "When" in terms of implementations of instructional materials.

Sequence of Events That Actually Resulted

1. A quick synopsis

The matching of sequences with the suggested flow chart indicates that after step three, i.e., the gathering of input data, step eleven, i.e., the securing and producing of specified instructional materials, followed.

It would then appear that from step eleven a recycling occurred. That is, the attention of the team was again concentrated in steps three through seven.

2. A closer view

It might clarify the reader's perception concerning the sequence of events if certain steps along with its conditions were considered.

To begin with, step one was never actually considered. Rather, it was a given condition. In other words, university policy concerning the geography course was more interested in the fact that a course existed rather than how it was to be planned and developed. Thus, the team faced itself with a traditional climate which indicated that the course was unique unto each of its instructors. The point presented now - to be developed later on in this section - is that any directed energy would be received with subtle resistance.

In relation to step two, it would appear that the Geography Department received the talents of the ISDP team as a means to an end. That end is the further financial assistance of EDP in improving the 204 course. This may appear as a paradox since the above paragraph suggests resistance by the staff. To be sure, the resistance referred to is unintentional, but nevertheless it is there.

Step three had never been operationalized until Matley, during February, 1967, had undertaken the necessary leadership to gather a ranking of concepts shared by the course instructors. This undertaking is regarded as the sine que non for an instructional strategy.

Meanwhile, it must be remembered the university courses do not wait for new ideas. Rather, these "innovations" assimilate bit by bit into the ongoing instructional process. Hence, the so called "quick-fix" was an accepted part of an overall strategy. This last statement can be supported in terms of the general purpose of the Geography Department seeking aid:

The purpose of utilizing the talents of EDP and ISDP is to improve the instruction of Geography 204. Note that the materials secured and produced for the quick-fix did just that, i.e., improved the instructional communications of each of the instructors. Therefore, it is sufficient to say that each instructor felt to a degree satisfied that his communications to his large class was enhanced by received instructional materials.

The above paragraph is not to be confused with the development of course objectives, i.e. instructional strategy. The development by the Geography Staff of instructional objectives has been and still is a slow process which is characterized by the matching of sequences with the first eight steps in Ryan's Flow Chart. That is, in terms of the suggested fifteen steps, the trial procedures for analysis and design of instructional systems employing instructional media has not passed the eighth step.

3. A suggested interpretation of the quick-fix

It was suggested before that indirect resistance existed. The assumptions to this speculation are the following:

a. The course had been accepted as being taught concurrently by instructors each of whom had a unique approach to the introductory course.

b. Although the Geography Department wanted to improve the course, each instructor faced a challenge to his autonomy by the fact that an analysis and design of Geography 204 for the utilization of instructional media forces a consensus as to concepts.

c. The climate of change at MSU has influenced the Geography Department, but at the same time has conflicted with traditional instructor expectations. (e.g., a specialized approach to conducting Geography 204.)

d. The initiators of change for Geography 204 are not perceived by the faculty as coming from within their department but rather from the outside, i.e., EDP and ISDP.

With these assumptions, the significance of the "quick-fix" is interpreted along the lines of Everett Roger's characteristics of an innovation.

First of all, it is thought that the "quick-fix" represents an innovation - new idea. It is the key for gaining an awareness of the faculty as to giving major consideration to improving the instructional objectives of the course.

As Rogers states: "It matters little whether or not an innovation has a great degree of advantage over the idea it is replacing. What does matter is whether the individual perceives the relative advantage of the innovation."

The point taken is that the "quick-fix" innovation opened the opportunity for the sophisticated "instructional strategy" innovation, which is now in process. To support the statement that the quick-fix is an awareness factor which cracks the unintentional resistance apparently held by the instructors, five characteristics of the quick fix are briefly discussed:

1. Relative Advantage

Relative advantage is the degree to which an innovation is superior to ideas it supersedes. In this case, the quick fix resolved the problem of increased enrollment by enabling visuals of various sorts to complement the lectures.

At the same time, the quick fix represented found money, since these materials were not at the expense of the Geography Department.

2. Compatibility

Compatibility is the degree to which an innovation is consistent with existing values and past experiences of the users. The use of provided instructional materials still enabled each instructor to use only those materials which served his instructional purposes. Hence, the use of the quick fix was suggested by the department and at the same time useful to the instructor. Hence, no conflicting values.

3. Complexity

Complexity is the degree to which an innovation is relatively difficult to understand and use. Instructors found it easy to locate materials at a designated section in the department. Each had their own set of slides. Equipment used to transmit the materials were already stationed in the lecture rooms. Thus, there was little complexity to the use of the quick fix.

4. Divisibility

Divisibility is the degree to which an innovation may be tried on a limited basis. Because of the range of instructional materials, instructors could try out samples of the quick fix. That is, they could set their own pace in experimenting with their lectures. Rather than all or nothing, bits at a time could be tried out.

5. Communicability

Communicability is the degree to which the results of an innovation may be diffused to others. The quick fix was easy to describe to others. Each instructor could relate his experiences to the other. At the same time, recitation sections could indirectly confirm whether or not the use of selected instructional materials enhanced the responses of the students.

The view of the quick fix is thought to be that of setting the stage for the receptiveness of the Geography faculty in regard to their analysis and design of an instructional system employing instructional media.

Outcome of Development Activities - Resolved and Unresolved Issues

1. Resolved

Tantamount to the development activities carried on so far is the realization by the Goegraphy 204 instructors that there must be initial goal priorities set up. These priorities are the instructional concepts for the course, e.g., "common elements." Even though there was a need for the quick fix, it became apparent that a base was needed for developing an instructional strategy. Speculating on the last statement, it seems that the quick fix forced the attention to the cliche: "Now that we got it, how can we use it?" In other words, an awareness climate was provided.

As to the activities set in operation so far, logs ten, eleven, and twelve can provide information. More important is the fact that ISDP involvement enabled "housecleaning" to occur in operational policies for Geography 204. For example, coordination action is being carried out in regard to the instructional policies of the recitation classes, e.g., amount of readings, same number of tests; interest in being directed towards the incoming expectations and the outgoing attitude changes of students.

Although ISDP activities terminate this spring, it appears that Geography 204 has begun developing its own inertia. The planning and development activities will continue provided that leadership is implemented and financial support, e.g., EDP, is forthcoming.

2. Unresolved

The talents of the developmental team are only as effective as the people who contemplate their suggestions. A systems approach is sufficient for constructing and developing an instructional strategy, but a willingness by the Geography members to form a temporary social system is a necessity for substantial improvement to occur. For temporary systems, one should consult Chapter 19 of Miles Innovation in Education.

The point is, there are two types of systems involved in an ISDP. There is the systems approach which deals with the following:

---defining performance goals

---translating these goals into sub-systems of general and specific functions

---specifying the means of executing these functions and defining the components of the systems including human capabilities, machines, and materials

---distinguishing between functions that can best be performed by persons with known competencies and functions that can best be performed by instructional materials

---planning schedules and sequences of events so that all components of the designed system, when tested and retested, maximize performance of the system as a whole in accomplishing projected objectives.

It is believed that this, i.e., the above, is sufficient condition for change to occur in the discipline. However, the temporary system encompasses the interactions identified by the systems approach. The human involvement of receiving and then acting on the planning and development activities cannot be left to "good faith." That is, there is unresolved issues to the setting up and the implementation of the faculty's temporary system. For example, there is no reliable data to answer: "What are the restrictions imposed by reality which cause the instructors to take a passive role in working with the Geography Coordinator?"

Hence, the unresolved issue centers on whether or not the temporary system is a necessary condition for a systems approach - which leads to the development of an instructional strategy.

To rephrase this concern, one might give attention to those questions:

> Why must a year elapse before the Geography instructors identify common concepts for their 204 course?
>
> Why does the Geography Coordinator find a delay in implementing a policy with his fellow instructors?

Are the decisions made by the team, i.e., Geography Coordinator, Media Specialist, Learning Specialist, the same decisions that are carried out by the instructors?

Suggested directions in regard to unresolved issues:

1. Establish necessary and sufficient conditions for systems development.

Example one -- It is necessary that there exist a temporary social system - which can be distinguished by its input, process and output characteristics - in order that decisions are acted upon.

Example two -- It is sufficient that a systems approach can be carried on by a "team" which will devise an instructional strategy.

2. Establish measurements which can trace the flow of communications from the team to the instructors and from the instructors to the team. Perhaps in this way insight can be revealed as to the how and why that decisions are negated, modified, or accepted.

The concluding statements regarding the analysis and design flow paradigm centers around the organization. This speculation might be given impetus if one lists under the organization subgroups within subgroups, i.e., concentric rings. When a number of subgroups are identified as those coming under the auspices of ISDP, then one should attempt to investigate what subgroups are left out but contribute controls necessary for gathering input data; steps two and three of the model. In other words, it is suspected that more information is needed as to steps one through three than are actually collected. Perhaps systems work could be made to produce more efficient results within a shorter range of time if such information were collected.

A. Comparison of kind and sequence of development steps employed with those states in hypothetical model.

From previous reports, it was indicated that a "quick fix" was undertaken as a temporary measure. The identification and selection of those instructional materials were presumed to be undertaken by the faculty members involved with Geography 204. Supposedly, those officially concerned with the course were to proceed with planning and development.

At the start of the fall semester, there was no written evidence of faculty improvement in regard to curricular decisions. During the past months of consultation with Matley, it appeared that his efforts to identify concepts had resulted in "awaring" the faculty of latent problems that are associated with surveying the course.

Although there has been limited success in securing specific areas of agreement in regard to the "whats" and "hows" of instructing Geography 204, there has been administrative success in setting up policies regarding the quantity of student work.

It is suggested that while the developmental team was involved with guidelines for planning an instructional strategy, the faculty members were involved with basic housecleaning details. In terms of the flow chart, it might be construed that the developmental team was interested with curricular objectives while the Geography 204 faculty was interested (passively) with administrative objectives.

Perhaps a decision stage should have been built into the flow chart between the gathering of input data and the specifying of behaviors.

B. Estimate of the generalizability of developmental model to other higher institutions pursuing instructional development.

1. ISDP model as is:

a. The model does not distinguish the students as being either in the system's environment or of the system itself.

During the past meetings, discussions were directed towards identifying the students' expectations from the course. Not only was there interest concerning what the student expected to get from the course - in terms of cognitive information - but there was academic concern as to the students' affective change.

Although Matley was impressed with these concerns, it appears that since his faculty has had no data concerning their audience, the students' expectations were not taken to be an input for the analysis and design operations.

b. The model is a logical flow pattern that one would expect to be carried out under ideal conditions. It is a linear description that leads to further probes of a protein society. If one accepts the concept that a system permits the meaningful identification(s) of sub-systems, then one may be optimistic about the values of the flow chart since it heuristically leads to the revealing of a heirarchy of sub-systems and their various social structures within. In short, the flow chart enables a team to begin working where the clients are.

2. ISDP model with some modifications:

a. Specify changes

It is suggested that when a courses' concepts are not consistent, and/or mutually reinforcing, there are sub-systems that were not considered. If these components are not identified then the flow chart lacks integration. For example, Matley's undertaking to produce Geography 204 concepts for faculty consideration was met with barriers of communication; this barrier was based not on content as such, but on how the content shold be presented.

If the purpose of the Instructional Systems Project is to improve the flow chart, then one might consider the refinement of the "gathering of input data stage" and the "dry run-through-field testing stage."

Under "gathering stage," there might be a need to specify consensus agreement concerning so much of a course. If there is lack of agreement then there might be several configurations to aid in bringing in additional information (e.g., department policies; national curricular policies; student expectations.)

Specifying terminal behaviors can only begin when the input stage has been given a simulated dry-run through. Concurrently, some instructional aids can be secured which do not affect the ongoing curricular decisions. Such aids would be those that improve the existing lecture presentations (e.g., fidelity of communications).

PROJECT EVALUATION TEAM REPORTS

The general design of this study called for periodic reviews of the instructional development activities by a team of four independent observers, The Project Evaluation Team.

These evaluators obtained access to the work in the development proceedings at the four demonstration institutions by means of tape recordings of discussions, transcriptions of tapes, activity logs, and the four project review meetings with team members, as described in Chapter II.

On the basis of these data, the evaluators have prepared four reports encompassing certain objectives of the study. They are presented here as follows:

1. Analysis of the Data Secured on Actual Development Procedures - Dr. Phil C. Lange
2. Heuristics of Media Implementation in Instructional Systems Development - Dr. John B. Haney
3. Usefulness of the Development Model for Generating Research Hypotheses and Specifications for Specialist Training - Dr. John M. Gordon
4. Dissemination Value of the Demonstration Approach - Dr. John Childs

ANALYSIS OF THE DATA SECURED ON ACTUAL DEVELOPMENT PROCEDURES AT THE FOUR COOPERATING UNIVERSITIES

Dr. Phil C. Lange

Data-Gathering Strategies

As previously mentioned, the decision-making discussions of the Instructional Systems Development teams at the respective universities were recorded on audiotapes. The circumstances on some campuses were such that members of the team had chance meetings and discussions at other times than their scheduled tape-recorded meetings. And sometimes progress was made along decision points at these chance interchanges that were not recorded. Nevertheless,, the tape recordings were highly revealing in showing the range of different ways that the different teams gradually moved through the steps of the model, although seldom was this movement by a smooth, direct path as sequenced in the ISD model. The teams often moved around frustrating decision points, jumping ahead to more familiar ground, and then backtracking later. For example, in the first year of the project, this was typically the case when teams tried to begin with a fast, direct approach to the initial analysis of course objectives to be stated as student behavioral outcomes. In such instances, as many as three of four consecutive sessions made no progress in detailing behavioral outcomes. Yet essentially the same team members working later with other instructors avoided this "hang up" in discussions about specification of behavioral outcomes by going directly to the end-of-course test items or by running through the steps of the model at a low level of approximation; and then recycling through the steps again to establish better specification and precision of decisions with each cycle. In short, as the teams became experienced, the tapes indicate that the media specialist and the coordinator and the evaluation specialist became much more capable in getting more data from the professor at the in-put stage and then making from this a tentative translation to behavioral outcomes and operational procedures.

In the early tapes there are occasions where the professor could not or would not (or even fought against being asked to) describe student behaviors or performances. But he was eager and willing to describe and analyze his teaching behaviors; and the coordinator or media specialist seized on this behavior as a focus for instructional improvement. When this occurred, invariably the discussion tended to move rapidly and verbally through the model (if one interpreted the steps as describing the teacher's past behavior). Such "input" data usually established a bridgehead: the teacher's satisfaction or dissatisfaction with student results or attitudes. On such a bridgehead the evaluator or coordinator might bridge over to what each student would need to do in the course the team was improving.

Whereas, a tape recording of any single session of an ISD team often presents the listener with a confusing problem in placing precisely the discussion threads according to the ISD model, the full set of tapes of a team's session reveals the high compatibility of the model and the actual decision points recorded. As the participants themselves have said in retrospect, the ISD model serves as a map. Thus, some of the early sessions (at the "input" point on the ISD model) seem to have discussion topics that verbally touch on practices and problems that appear all over the model. But while these sessions sometimes make no forward progress to the next decision point on the model, the ISD model serves like a map to encourage more deliberate attention to "input" so as to be better prepared for what probably lies ahead.

The tapes objectify many of the team conclusions, for example -- that the "input" step is a most important step. Getting the necessary facts here pays off in smooth sailing later. The tapes on "input" discussion bring alive the simple idea that excellent college teachers may actually know very little about the students they will have to teach, or the facilities they will have, or the curricular validity of end-of-course evaluation. When an instructor honestly, immediately admits, "I don't know the background of students," "All I want to develop in the student is a life-long excitement for this field," "We devise a final examination that spreads student scores so that their marks range something like a normal curve," "I think our course would be better if we used more visuals," -- the next step to "specify entry and terminal behavior" on the model seems far away.

Another revelation on the tape recordings was the different styles of decision-making in which individual team members functioned in their team relationships. Interestingly, the variation of a different professor in a team might greatly affect the style of operation of the other team members; and the style or pattern in which one of the specialists functioned in the initial session tended to persist through several sessions. For example, in one team, the media specialist was consistently the member who began early to press for specification of behavioral outcomes and operational descriptions whenever the professor kept speaking to the matter of audiovisual aids and equipment. Yet, this same media specialist functioning in the same semester in the opening sessions of another team (with a professor who felt he was maneuvered by his administration into having to do something about his course) functioned as the member who baited the instructor along by a chained revelation of the assistance and "goodies" that might accrue to the professor as he took steps to improve the instruction.

Most evident in the tapes themselves are the frequent, lengthy interchanges that do not result in decisions. As one professor remarked, "a team may have to spend a lot of time getting to know one another before an instructor is ready to reveal what results he wants in students and how little evidence he operates on." Also, something happens to individual judgments between taped sessions. Quite often a session begins with a happy resolution of a problem or issue that was the troublesome, unresolved and sometimes emotional ending of the previous session. In fact, the team seemed to become skillful and intuitive in closing a session by calling attention to their unfinished agenda items (as if planting the bulb that blossoms at the next session).

Further analysis of the tapes for their "decision-moves": The tapes have not been analyzed for the gamesmanship of inducing and avoiding decisions -- except as some broad guidelines are stated in the "heuristics" for practitioners (see page 79). Such an analysis, however, might be applied to these tapes, for it is quite apparent that when a different professor is a member of a team, the other members quickly draw upon different resources in their repetoire of group strategies and meld their combined involvements into a new strategy for moving toward decisions. This applies to the team when it is mature in its sixteenth session as well as in its earlier sessions. The "sparring" that some participants make in early sessions is almost entirely "counterpunching" or "responsive," whereas other participants spar mainly with initiatory thrusts, plus more thrusts, and more probes.

ISD model helps make sense of tapes: For the purpose of this project, the tapes do show in the long run -- allowing for informational scoop-backs and timely advance scouting -- the decision-making procedures of the team roughly approximate the steps and the sequence in the model. However, direct discussion of the model itself, or even its steps in the early sessions, tend to confuse and delay the actual decisions. But, it was not the purpose of the project to discuss the model to ascertain its fitness. Thus, it is reasonable on the basis of the taped records to say that the model had a "general" or a "conditional" fit in the university settings. This is especially true when the team uses the model as a map to enlighten its activities and progress.

(a) Tape abstracts: The tapes were also subjected to analysis whereby they were abstracted for the questions posed, the decisions reached, the sequence and relation of questions and decisions, and the team member initiating the action. As already noted with reference to taped records, these abstracts also showed the same patterns while losing the emotional overtones and stress that are so apparent in the tapes themselves. The abstracts, however, make it very easy to see how each team member may carve out a functional role or be rifling in on a decision he wants. The abstracts, for example, show that when the evaluation expert joins the team for the first time there tends to be a radical change in the content of the questions, in the shared leadership in the group, and the participation of the group members. In several of the team records, the evaluation specialist joins the team either during an impasse with, or a detour around, what the model labels "specifying entry and terminal behaviors." His presence is the occasion for getting at the same thing from the bottom end: "Are you satisfied with the evidence of what your students can do at the end of your course?"

(b) *Expectation and reaction forms*: Another written record available in the first year of the project was an expectation-progress and reaction form filled out by participants before and after each team session. Later this procedure was replaced by a log kept by the coordinator; the shaping of the individual expectations was replaced by shared planning for each session among the coordinator, media specialist, and evaluation specialist. The obvious thing about data from the expectation and reaction forms was the degree to which everyone *overestimated* the *expected* progress from sessions getting at "entry and terminal behavior," an extent to which these early sessions therefore were rated as accomplishing "much less than expected." Although the use of the individual expectation-reaction forms were generally discontinued, there is enough basis to indicate that the professors pretty generally underestimate the time, care, and information that must be invested in the input stages and agreements on outcomes; and some other members too are consistently overoptomistic even though they are more likely to be satisfied with "less than expected." As the teams got older, all members became more realistic in expectations and satisfactions.

In some further study that might wish to analyze more rigorously the gamesmanship of decision making, the use of something like the expectation and reaction form would seem to be essential; for there are several instances where a team member who was basically a "counterbuncher" or "responder" was almost a non-participant in the entire discussion session when his "expectations" had not been introduced or thrust forward by other members.

(c) *Summary logs*: In the second year each team coordinator wrote summary logs following each team session. The logs frequently included editorial-type observations and judgments, and often the logs identified or even elaborated important factors of school politics. Or the log might include the coordinator's guesses about hidden agenda, or venture an interpretation of why a team member did what he did. These are the kind of data that are *not* included in the abstracted report of a taped record. Thus the summary logs often make explicit the importance of political factors that a listener could only imply from an edition of the tapes. In short, such factors as peer pressure, administrative support, prestige relationships, etc., that reinforce instructors when they make changes to improve instruction are more quickly noted in the summary logs than in the tapes or the tape abstracts.

(d) Quarterly and terminal reports: The quarterly and terminal reports of the teams and the occasional national conferences among all teams and project personnel arch over longer time periods and evidence a mellowness and a gross accumulation of much change and highlighting, which is not so easily apparent in reports of individual sessions. Thus, long-range reports rather consistently say that the ISD model fits their developmental process, at least conditionally. Typically, the professor reports with hindsight that it was tough going (or he wanted to quit) when the pressure was on clarification of entry and terminal behaviors -- but in retrospect it was the best kind of discipline for him. Other professors are equally adamant in saying that someone other than themselves can translate their teaching behavior into behavioral specifications for students. The more experience the teams had with the systematic improvement of instruction, the more generally did they apply the ISD model to their efforts and the more helpful did they consider it to be.

These long-range reports are the excellent source for many of the "heuristics" which might be researched as high probability hypotheses. In the meantime, these "heuristics" from the combined experience of the four ISD teams can serve as guidelines for those who wish to apply an instructional systems development approach to their own projects for instructional improvement.

Procedures and the Hypothetical ISD Model

The primary function of each team effort was to improve instruction. A correlative but secondary function was to test the applicability and usefulness of the ISD model. There are many ways that persons can learn from or use a model, to list some:

(a) by adopting the model as is (rather unquestioningly) to be "plugged in" like a unified module for operation as a sub-system in the overall operation.

(b) by exploratory applications and adaptations of the model, along the approach of "action research" (scientific "if-then" problem solving).

(c) by creating counter models, building better models (comparison).

(d) by creating a generalized model from their own experience (inductive arrival at an "experience model").

(e) by critiquing a sequence or matrix of decision-making actions with REFERENCE TO THE MODEL.

(f) by generalizing about UTILIZATION of model introduction.

(g) by reading)
hearing) how the model was used
viewing via media)

(h) by seeing ALIVE how another person uses the model (one dissemination aspect of this project).

Actually, the data in this project could be clustered about these natural polarities with reference to modeling. In this listing, e, f, g, and h were part of the evaluative and dissemination aspects of this project.

Adopt or adapt or generate anew is a crucial issue in a through d. This aspect is discussed further by R. Lippitt in American Journal of Arthopsychiatry, July, 1965, 663 pp, Lange in NSSE, 1967, Yearbook: II.

The data in this project would indicate that at the beginning the participating teams tended to perceive the model as fixed and as a rather rigid prescription; this rigid prescription was not adopted. The same teams later were viewing the same flow chart as generalizing the steps and the sequence as being flexible and viable with local conditions; and this viable perception was accepted as tenable. Thus, the model may be changed subtly by level of understanding as well as by a formal change in kind. Evidence of this is the fact that the teams consistently found the model more acceptable, while at the same time they more verbally criticized its lack of detail and the prospect of pluralistic refinements and loops, even while simplifying the model to fit formats and audiences.

Readiness is the over-riding factor, while the underlying problem is how to diagnose for readiness and initiate level of treatment. Readiness and diagnosis for readiness apply whether the reference is to the teams' understanding of the model, or the teams' application of instructional systems development to a college course. In short, there is some evidence here to indicate that (a) initially model adoption is more difficult than model adaptation, (b) later when a group matures (has worked together long) it is more in an adoptive mood, but adoption may imply interpretations. From his experience, S. M. Corey in, Helping Other People Change, notes that when groups begin working together, their initial energies are mainly directed to interaction with each other and interpolations; later with maturity the group is more actionable and more receptive.

As to diagnostic procedures, it is true that the project participants have verbalized their hunches, rules-of-thumb and sensitivity indicators; but the evidence shows that these must be subjected to the action research of empirical efforts.

When not to use ISD; when not to apply the model: This project set out to apply ISD and to test the usability of the ISD model. It did not set out to test its no limits. The energies were committed to making it work, but the data are filled with evidence of withdrawal feelings, concern about the material and human costs, and the importance of selection. Thus, it is extremely important to stress that the ISD model is a change model -- a production model: theoretically, it is inappropriate where there is no product or where the idea of the product is not communicable.

The language of the model also implies change, not only in the instructional moves, strategies, and materials, but also changes in the instructor and the students. This introduces an ethical question when the instructor, for example, does not want to change and enters the ISD plan with no awareness that the system is set to change him in some way. His right to be forewarned of the risk of change and his option not to begin need to be respected.

The ISD model is a man-and-materials system: It is not to be confused with systems development in those technologies where reliability is paramount to the exclusion of human variability. Moreover, it is a system designed for higher education where there is a tradition of academic freedom for instruction and an expectation that students can be articulate and mature both about their learning and their processes.

The ISD model lacks automatic ejection outlets for wastage: This ISD model differs from many production models (as in a factory production) in that it shows only what continues on through the system. It shows neither what gets trimmed off as waste (discarded objectives, assignments, etc.) or what may have been converted along the line into by-products (research skills in graduate students, attitudes in team members, etc.). And to this extent, it makes cost accounting more difficult. But ejection when it occurs in this model must hinge on human judgment at the time, tempered by experience. From such experience guidelines may develop. Some objectives, some demands, some instructors could ruin this system or this system could ruin them. The implication for the application of the flow chart is that its users must apply human judgment along the way at check-points to screen out something that shouldn't be going through the system. The other side of this quality control along the way acts to keep the materials and humans within the interaction of the system when there is high probability of gain.

The data also evidence difficulty in putting value on change. This is distinct from determining cost. For example, one team might be working to make technical and quality-control refinements on already excellent instruction, while another team might be working to bring direction to an otherwise aimless ineffectual course. Which change is more worthwhile? Which changes should have the highest priority? With which type of change at what level of performance should a university team begin, and when should it give up in the absence of what results?

Implications for application of the model: It is interesting that the participating teams chose not to spend energies on elaborate or precise revisions of the model. As noted in their terminal reports, they found a working interpretation of the ISD model for their situation. Thus, there seems to be some basis for concluding that eventually the general nature of the model contributed to its success. Nevertheless, in their initial use, some users had comments or criticisms like these about the ISD model:

(a) The ISD model implies more sophistication in evaluative rationale and course objectives than is actually the case.

(b) The ISD model gives little help in deciding when and where to start. "Begin" contributes little to the flow chart.

(c) The campus politics and the administrative organization for change probably have more importance at the "input" step than the model recognizes.

(d) The great difficulty in dealing directly with "entry and terminal behaviors" is not made adequately evident in the flow chart.

(e) The ISD model actually implies that the learner and his learning gain must be a consideration all along the steps of ISD; but this is not as evident in the rationale of the model as it might be.

(f) The rationale for the membership of the ISD team perceives an "improvement of instruction role" for the media specialist, whereas the local image may be that of an audio-visual service that purchases equipment and provides requested materials.

(g) Some subject matter areas, some levels of instruction in areas, and some methods would seem to be easier applicators than others; but the model seems to make no differentiation among levels or strategies. (Later the same teams no longer raised this kind of criticism.)

(h) The differences in instructional styles and in the learning styles of students are not adequately recognized in the ISD model. (Again this was an early criticism which team members no longer made as they became more experienced with the model.)

(i) The model is too detailed and its language a jargon that need not be imposed on the professor and his colleagues.

Other Ways of Looking at Instructional Systems Development

The ISD model directs attention to the operational relationships of decisions being made to effect instructional changes. These same decisions could be reviewed to see how they might fall into three domains: administrative decisions (e.g., who shall be educated, how long, at what cost, in what facility, with what personnel, etc.), curricular decisions (e.g., what shall be taught, when, to what level of proficiency, etc.), and instructional decisions (e.g., how to manage the environmental factors so as to bring about the desired learnings).

This analysis might then be correlated with the theoretical roles of evaluator, coordinator, media specialist and subject-matter specialist, -- and with the actual practice in each team.

The frequent discussions about "campus power" and "campus politics" would suggest that a sociological or political science study of the power factors in the decision-making processes in ISD would reveal decision points outside the perimeter of the evident ISD steps. Similarly an economist would very likely reveal that for economic reasons many degrees of freedom are lost or not even considered as alternatives at decision-making points in the ISD model. As noted previously, he would very likely inject into the input some tentative formulas for relating worth of change and the cost of change to specific cut-off and feedback points along a linear model like ISD. In their own different ways, the anthropologist and the social psychologist can see other reasonable relationships in instructional development.

Yet it is noteworthy that once having been exposed to the ISD model during two years of their own instructional system development, these participants found the ISD model workable for its fundamental steps and its basic structuring of those steps. The ISD model, however, took on coloration from their experience; and the ISD model as they finally recommend it has subtly changed its perception as it became alive for them with the following "heuristics."

HEURISTICS OF MEDIA IMPLEMENTATION IN INSTRUCTIONAL SYSTEMS DEVELOPMENT

Note: This discussion was adapted for use here from an address by Dr. John Haney, at the conclusion of the four development teams' reports on Project activities at the 1967 Convention of the Department of Audio-visual Instruction of the National Educational Association in Atlantic City, New Jersey. In several points, he refers to the preceding presentations by team leaders.

The professors whom you saw in the preceding filmed interviews are real people, certainly, the kind we media specialists deal with every day. Remember the one who said, "I don't care about the development model," another who said, "I don't care who reads the research," and another who said, "I'll be damned if I'll write my behavioral objectives"? Their remarks draw to mind an incident that took place a great many years ago and involved a new instructor at Columbia University. President Nicholas Butler said to him, "You know, some day you'll be looking out at a sea of workable faces, and somewhere in the back of the room you'll see a person who is frowning and shaking his head and you'll be tempted to reach out and grab him by the scruff of the neck and shake him. Don't do it, he's probably the only one that is listening." To a certain extent, these professors, whose remarks at times appear negative, are the ones working with us in this Project, and represent the many other instructors with whom we media specialists will deal in our operations.

As a media center practitioner, one whose hands are continually dirtied by the nitty-gritty chores of working with real faculty members, and real courses in a real environment, I am vitally interested in the major purpose of the Instructional Systems Development Project; i.e., to increase the understanding of instructional development so we media specialists and instructional specialists can be more effective and efficient.

For instance, my experience in this study tells me that in the future, whenever I deal with such a whopper word as "understanding," it should be further defined. Also, that as helpful as the construction of a hypothetical model or flowchart was in instructional development, and as valuable as its testing and demonstration are to the results of this study, the most important product is more than simply a revision of these steps, or a refinement of the boxes and lines in the model. It is learning how to operate within the model to get desired results.

For each "what" represented by the labeled boxes or steps in the model, there is a "how" or a collection of strategies, tactics, gambits, plays one devises or calls forth to make a model work. Obviously, the more of these things the instructors and specialists have in their grasp, the more likely it is they will be effective and efficient. However, these competencies are the mark of experience, not conflicting with formal preparations and theory in empirical research, but somehow parts of it. Often they guide us intuitively. Sometimes articulated and passed along by tradition like a ballad from one academic generation to another. These are the result of what one has found proceeding from new discoveries and from past discoveries which guide one's course of action.

The articulated heuristic may seem to be the poor cousin of the stated hypothesis of empirical research, but more likely it is the father. John Gordon, another member of the Evaluation Team, calls this kind of hypothesis a past heuristic, for which research is most profitable to the extent that heuristic is true.

A principle, a functional principle, is a polished heuristic. Von Clauswitz, reflecting upon his experience in war, formulated a concept of surprise and concentration of force, a heuristic still used by victors and relearned by losers all the time.

In this McCluhanistic age, heuristics are passed along, not only by word of mouth; this is, "if you can't lick them, join them," embroidered wall plaques, "a penny saved is a penny earned," and printed in books. Remember Dale Carnegie's best selling book of heuristics of the 30's, How To Win Friends and Influence People? He said, "Remember that to every person the sweetest sound in the English language is the sound of his own name."

Heuristics appear on buttons that you see up and down the Boardwalk, bumper stickers, and TV screens. Heuristics are not the exclusive possession of the old and wise. As the young actor would say, "Never trust anybody over 30." Also, some distinction may be made between the rules of a chess game and the player's heuristics. The rules are stated -- they declare how the game is played. The heuristics are acquired -- they are how the game is won. As Robert Davis, the learning specialist at Michigan State points out, "Nobody plays chess following a model because he'd get clobbered!" In the period after the opening formal moves, the player is guided by such heuristics as, "control the center of the board," or "develop each piece to the maximum."

What is the relation of heuristics to the kind of formal research we've been engaged in in this Project? Let us consider, as an analogy, the work of Kinsey, Masters, and Johnson as researchers in the field of human sexual behavior and response. These scholarly investigators presented their findings in statistical tables and analyzed the physiological process into a four-step flowchart. But as a guide to the practitioner in the field for strategic planning and the allocation of scarce resources, one is likely to rely more on the heuristic offered by Ogden Nash, "Candy is dandy, but liquor is quicker."

In the case of the Project research at hand, there are a number of heuristics I have observed which relate the instructional development model to reality, tie the steps to the real life process, and make it work. In addition, some of these heuristics generate research hypotheses, and form a major part of the content for a curriculum preparing instructional development specialists. Heuristics are not generally academically respectable, but these are obvious and may be useful because they are so often ignored. While admittedly over-generalized, they are, nevertheless, generally true. What they lack in rigor, they make up in vigor. For each of the heuristics I have chosen, I will cite an example from the Study. There are about fifteen I have selected for discussion here.

Heuristic #1: The development of "software" is more costly than the acquisition of "hardware." How often do you see people fascinated by hardware? When you ask them how they're doing they may well reply, "Well, we're just beginning to get our hardware installed. We're going to have a two-week workshop to permit the instructors to write programs for the next year." Programmed-instruction people some years ago had a rule-of-thumb-- 30 hours of program writing time for one hour of finished product. Production of validated materials requires a similar rule-of-thumb. The more often this need is ignored, the more often difficulty is encountered in multi-media, computer-assisted instruction, and in other kinds of instructional development.

Heuristic #2: The development of "software" is a continuous process. The development process here is not just a matter of completing a task and leaving it, but realizing that the production of, for instance, graphs involves a series of successive approximation. Even when the objectives are achieved, you may find that the instructor has altered his objectives. This is more than ordinary evaluation or revision, it is a continuous process of refinement.

Heuristic #3: Always move toward finding the instructor's objectives. The model is explicit on where to start logically. But, what do you do when you run across a professor like the one who said, "I'll be damned if I'll sit down and write out behavioral objectives." Do you quit, do you go to somebody else? No, you really can't. But, you can have a bag of tricks at your command so when he states, "I think I want my students' curiosity wetted about this," you reply, "Alright, given you have a student whose curiosity has been wetted, what does he do?" This is one way of getting at behavior objectives, or as Syracuse pointed out, use an observation-verification approach; i.e., "Let's see your examination and classroom. Let's observe what's going on. Let's articulate and state apparent objectives and see if you agree." This is one way of moving toward the objectives without having to bring everything to a halt if he doesn't want to sit down and define them.

Heuristic #4: Involve the students continuously in the development process. You'll often find people in judging instructional situations saying, "I think," in speculating on the effectiveness of instructional materials. The student, himself, is a prime source of information about what makes materials effective and useful for achieving his objectives. Often, significant revisions can be designed by having even a single student work through the materials and discuss the experience in an interview with the developer. Include the student in the development process whenever possible.

Heuristic #5: The developmental model is universal only in a general way, functional clusters and linear sequence. We thought at the beginning of the study that we could test out the 15-step development process and come up with a more refined universal model. As you may have observed, each of the institutions introduced its own variation. Perhaps there is a sub-heuristic that says people never adopt, only adapt. This is certainly true here. There are some general characteristics in all of the kinds of models, not only in this study, but also in those that you've seen when anybody talks about "the systems approach to instruction." These models are all linear and they have a feedback loop and certain general functional clusters. The value of the model is to rationalize procedures. But also as Robert de Kieffer points out, it can be used as a road map to show you where you are in the development process, whenever dealing with an instructor. In this study, we've developed several points of entry calling not only for feedback, but also what we call "scoopback"; that is, find out what the prior decisions were and other information before proceeding.

Heuristic #6: Stress the human elements in instructional systems. People have a stereotype about systems and technology, based usually upon systems analysis and systems application in industry and the military. Well, that doesn't really apply here. Our system allows for the human use of human being. We want to stress not only what the humans are doing, but what they can do as a reult of their involvement of instructional development. I would like to cite Blackwell's definition of technology -- the use of available resources to achieve value. As long as a person stresses that these decisions are based on human values, we have the proper relationship.

At first glance, the instructional systems development model appears to demean the instructor. It places greater emphasis on learner involvement. It requires inputs from other specialists, involves mediation of instruction, extends his instruction, and forces him to reveal his pre-teaching decisions. But on the other hand, he has more attention paid to him, more recognition as a gate keeper. When he makes a decision things happen, and he is credited as being an innovator. Stress the human elements in the system operation, especially the students and instructor involved.

Heuristic #7: Always proceed on the basis of agreement. This is important, especially when working with multiple sections and multiple instructor courses. Get agreement on procedures, criteria, objectives, and grading instruments whenever you can. Otherwise, there are too many uncertainties and uncontrolled variables. Now this does not always mean approval when we obtain agreement, but it reduces uncertainties and assures some commitment.

Heuristic #8: Don't let the "word" or "manner" get in the way. "Manner" is the way of making a dogmatic statement that may cut off a faculty member. "Word" may simply be a part of our professional jargon. We have to consider how statements affect certain faculty members. Sometimes an instructional development specialist may use the word "information-overload," adopted from computer technology, and find that a humanities' instructor has just plain "turned him off." "Behavioral objectives" can also get in the way. I once had a bumper sticker in my office stating, "Help stamp out non-behavioral objectives." This pleased me a good deal. But, it didn't really help in the initial contact with instructors. I don't even stick with the term "behavioral objectives," if by using the term "specific objectives" we can obtain the same results.

Heuristic #9: "Blame" the professor first. Students do this all the time, so why shouldn't the development team? What is he like? Maybe we can find out something about the instructor, e.g., what he needs by a shared common experience. A script is a good way. Also, what does an instructor need here? We had a television instructor who used his graphic artist more as a nurse than as an artist. Media people can sometimes be the top professionals in what Eugene Oxhandler calls, "media therapy." This is business that we're sometimes pursuing in dealing with instructors.

Heuristic #10: See that faculty members are rewarded for work in instructional development. The normal academic reward system is stacked against an instructor spending the required long hours and hard work in developing college courses. Find the effective and appropriate reinforcements for development work -- time, money, stratege, acclaim, support, etc., and crank these into the system and into the structure.

Heuristic #11: Structure the conditions for survivability and transferability. How many times have you heard about campus teaching experiments, and by the time you get to see them, the thing's all over? It's gone, it's had it, and been dissipated out of existance. Why can't materials transfer from one institution to another? What is the unit that can be transferred? Perhaps not a whole course, but how might instructional design develop in one place and be effectively used and accepted in another place? How can we overcome this "not-developed-here syndrome" that results in virtual automatic rejection of materials produced at other schools? There are the things that have to be considered and built into the development process structure. For example, if you wish to introduce an instructor to a programming device, and he happens to be an English instructor, your natural tendency might be to obtain a program on grammar or punctuation, and let him play with it. Don't do it because he'll fight the first frame on the subject matter. Get a program on contract law, give him a case study there, and ask him to find out if it is a valid contract or not. This permits him to examine the characteristics and principles of the device without first debating the subject matter issue. Don't throw a contract law example to a lawyer -- throw him one on punctuation.

Heuristic #12: When you reduce reality you also reduce the learning experience. This is a very simple one, but it looks like Edgar Dale's cone upside-down. It simply means that as you move away from reality to simulation, you are also removing something from the experience itself. An aircraft simulation is not an airplane. A practice session or rehearsing before the music instructor is not a real recital. If the learning criterion involves elements, such as audience presence, somehow the instructional system must introduce it. Don't assume that you achieve more through simulation than is actually the case.

Heuristic #13: Find the pattern or format that will balance benefits and liabilities. In bringing guests from the world of business into a televised course our institution offers in management, we try to strip the guest of all his "public relation" props and place him into an interview format, rather than a lecture format, in which he may read his public speech on the glories on the free enterprise system. But even with these changes, we find that the interview format can only be "saved" by the introduction and conclusion. Presently, we take an interview, review it, and then have the instructor insert into the tape an introduction telling the student what to look for. This pattern allows for the most effective use of the unique contributions a guest speaker can bring to the course.

Heuristic #14: Faculty members are not generally moved to change behavior as a result of reading a report on instructional research. The reports that show no significant difference in improvement comparison studies produced no real significant difference in the behavior of the academic community. Occasionally, these reports may help prop up an instructor, if he has some misgivings. You can also sometimes use these as a way of countering a negative attitude. But, merely passing out the results of instructional research studies will not motivate faculty members to change.

Heuristic #15: Nothing convinces like a visit. This is one on which part of this study was founded. But also, nothing can deflate like a visit when you find out what is actually going on, especially from talks with students and other members of the faculty.

These fifteen heuristics were drawn from the experiences of the development teams of the four project institutions. This collected wisdom shows not only what they have been doing, but offers some practical ideas of real use to media practitioners working in instructional development.

USEFULNESS OF THE DEVELOPMENT MODEL FOR GENERATING RESEARCH HYPOTHESES AND SPECIFICATIONS FOR MEDIA SPECIALIST TRAINING

Dr. John M. Gordon

Research Hypothesis Generating Mechanism

A hypothesis is a good hunch. A research hypothesis is a good hunch operationally defined. That is, it explicitly states both the present and desired states of affairs and the specific operations required to move from the former to the latter. In employing the described project model to design improved instructional procedures and materials. It was hoped that the decision-making requirements placed on faculty members and development specialists would yield researchable problem statements. However, this evaluator found little evidence of such outcomes.

What makes this explication so difficult? Is it not what all of us implicitly do when we generate an alternative solution to an existing problem? Is not what we choose to do out best hunch? If so, it would seem that a simple transcription of instructional decision-making should reveal a raft of hunches or hypotheses. These hypotheses should flow from the discussion as each participant offers his favorite alternative. They don't. Here are some reasons why this writer believes that research hypotheses do not automatically "flow" from practical decision-making.

1. Perhaps the most obvious reason is the failure or inability of instructors and development specialists to make explicit the present and desired states of affairs. Alternatives are generated and selected with little concern for the exit behavior of the students (desired state) and even less for the entry behaviors(present state). Instructional strategies are usually determined either by the instructor or specialists according to their bias for one of the newer instructional technologies; i.e., CCTV, programmed instruction, etc., situation. The tedious specification of behaviors at a level needed for acceptable research hypothesis statements is often by-passed to get to the urgent production of demonstrable packages in time for the meeting of classes. In other words, the necessary time needed for course and task analysis is usually greatly underestimated with the result that production is seemingly always ahead of the objectives.

2. The preceding rationale hints at the second reason; the specificity of the situation. The instance, the chosen alternative, stands by itself. It is not general to a class of situations and, therefore, obviously not meeting another important characteristic, generality. Even if a general hunch is applied to the specific situation, it is not readily apparent from the decision made. It is in the decider's head, and perhaps even unknown to him. It is extremely difficult to go from the specific "back to" the general, if indeed, it was there to begin with. In the observed development activities, no one usually broached the question of generality and the faculty members and specialist moved on to the next decision.

3. The third reason was also hinted at in the first discussion; decision-making in a restricted environment. For example, it is difficult to imagine a more limitating situation than one in which a faculty member is assigned to teach in a given room at a particular scheduled time. What might-have-been becomes the never-even-considered. For example, teaching method alternatives must be generated from the stale, traditional stockpile of what is there, rather than more general applications of feedback capabilities or response environment.

4. The fourth reason speaks to another facet of the general problem and perhaps is simply another way of saying what came before. It centers on the peculiar characteristic of instructional alternatives -- the trade-off. The teaching situations not only suffer restrictions of a physical sort, but of a personal value sort as well. Another way of putting this is that each of the participants in the development process has a number of "hidden agendas." The description of the present, desired, and operational states in a classic research hypothesis carries only implicit values. A business decision, for example, is made when all the relevant outcomes and operations have been measured by either their market or personal service value. However, the values of decisions in development procedures are weighed in a number of ways, still unknown to the math modelers. Some decisions reached may be directly contrary to the trial of the best hunch simply because operationalizing the best hunch "costs" more than the decision-maker can afford, either personally or financially.

The last point challenges the relevancy and usefullness of the traditional nonutility research hypothesis in the practical decision-making process. It should be replaced by value-explicit predictions using operational research, decision and Bayesian Theory statistics and methodology to take account of risks and regrets.

The regret and risk of these observations are that (1) we regret to inform the curriculum designers for media specialists that they will have to consider a radical departure from the old Fisherian notions of design, statistics, and decision-making, and (2) we risk our reputations on this protestation for we really don't know enough about it to take such a dogmatic stand.

We are relatively sure that the media research, thus far, has not come predominantly from media specialists and the media research, that has been done, is not readily translatable into practical day-to-day operations.

That hackeneyed phrase of "being all right for the theory but not good for practice" may be trying to tell us that the real world is not valueless for research, that development decisions are actually tradeoffs, not simple statements about "significantly greater learning."

Implications for Media Specialist Professional Preparation

Questions raised as to the competency breadth and depth required by the typical media specialist are complicated by the fact that he usually must be both "consultant" and "doer." These concerns refer specifically to the knowledge and competency in development tactics he should possess. For example, should a media specialist know the principle of test item development, instructional conditions specification, behavioral objectives definition, etc.? Where does the media specialist begin with the professor-client in the overall scheme of instructional systems development? How much is he expected to know, and how many capabilities should he have? Presently a major responsibility has befallen the media specialist. As the concern for better instruction has grown and more questions asked about the appropriateness of methods, the media specialist has been forced to offer some answers, even though his better judgment sometimes suggests he should not. The current concern for rational and expert instructional development practices has revealed the great complexity of instruction, and bared the large areas where pure conjucture is the best we have to offer. The media specialist, in trying to be all men to all people, has laid himself bare to the accusations of those who expect direct answers rather than hinted possibilities and statements of probabilities. Where does his competency begin and extend to? Can he really become a specialist, or must he be forced to remain a generalist about the complexities of instruction, and be considered only a first-rate tinkerer and mechanic?

This project has attempted to underscore the need for other specialist assistance. For example, the evaluation and instructional specialists. Also, it proposes that the media specialist should be allowed to confine his expertise to a much more selective, nonetheless, complicated arena.

What then is the specific domain of the media specialist, and how do we go about preparing him for this position?

The curriculum or learning experience for preparing the media specialist should include two elements based on the observations made in this project. The first set of experiences should be extensive demonstrations of:

1. The attributes and functions of the machines and materials with which the media specialist works; e.g., the "boiling, burning, and elasticity points" of materials, the stress and load that can be expected from machines.

2. The attributes and qualities of man as a message sender, receiver, and decision-maker; e.g., the rate, pitch, and loudness at which sounds become intelligible, the immediate storage capacity of a child; i.e., how long a sentence can he repeat, as in the Stanford-binet Intelligence Test.

3. The fundamental operations or interplay between man and machine-materials which cause a change in one or the other; e.g., how to operate a projector, or how to create maximal conditions for man learning a multiple discrimination.

The second set of experiences would extensively involve the media specialist trainee directly in the practice of point three above under both simulated and real conditions. Two separate, but obviously related activities, should be practiced:

1. The communications interplay between client and specialist, during which decisions are made in the instructional design process.

2. The actual implementation of the specifications outlined by the decisions reached in the course development steps.

The dialogue between specialist and instructor-client employs the knowledge of man as a decision-maker. The accompanying facilitative operation is analygous to the bedside manner of the physician. It sometimes can be likened to a clinical interview or even a detective's interrogation, as when certain principles or tactics are brought into play to tease out certain information, such as behavioral objectives. It is precisely these tactics and practice in them that is disregarded in current development programs. Equally disconcerting is the fact that the second phase, the actual carrying out of the decisions, can often be done by another specialist -- perhaps in graphics. A change in role, i.e., from a doer, maker and repairman, to a consultant who works with people and their ideas and then instructs another who does, makes, and repairs, marks the great needed transition for media specialists both in preparation emphasis and professional practice. Despite this assertion, it is likely that in many institutional settings the media specialist must continue to both be consultant and doer for some time to come. For this reason, the training programs should also include the second set of practice experiences, as well as those dealing directly with the materials and machines. The specialist, in acquiring some skill as passable graphics artist, photographer, and equipment maintainance is then better prepared to serve under varying conditions.

1. He can assure the materials development will meet some level of acceptability.

2. He becomes conversant with the "trade," so as to speak, and can communicate with a more skilled artisan or more specialist in the dimensions of the task, where they are available to assist.

But back to consulting role, lest we omit discussion of what is really quite obvious, that all three aforementioned sets of training principles are interdependent. Of the three, the tactics used in working with the client are the most critical set of principles. The other principles all come into play when considering decision alternatives; e.g., how much light is needed, for how many people, for what specific conditions, etc., and calls forth the total repertoire of the consultant.

In summary, two related, but separable areas of competency should be in the repertoire of media specialists. The first set deals with designing overall information transmission logistics. That is, given the major facilities, time, personnel, and financial limits, what major alterations are needed to accommodate strategies and materials of instruction if they are to be considered alternatives?

This advisary capacity is not to be misconstrued with deciding finally on what should be specifically done. It is more a listing with reservations of the possible system capabilities. These alternative capabilities can be, and many times are, specified before any consideration is given the goals of a particular course or objectives within the courses. The result is that often the "efficienty" of the means of instruction influences selection decisions more than "effectiveness," which is a more goal-oriented criterion.

The second area of competency deals with the specific message to be transmitted. The objectives should be well-spelled-out and the specific examples or information to constitute the message selected. The representative or media of the message and the learners human sensory modalities must be considered along with the professor's strengths in communication. The representative form decision centers about the capability of the learner for acquiring referential meaning from the message. If he has never seen an auk before, and the attributes of an auk are important, then some attempt to see an actual auk or meaningful representation seems imperative. The referent model can be selected from symbolic, iconic, analagous, or inactive categories, depending upon a number of criteria. Principles relating to size, color, contrast, etc., in iconic representation alone fill a number of books. Beyond need for a reasonable amount of knowledge in such a subject, the media specialist could well afford to rely upon the judgment of the artist. The physical form alternatives of the message, must be measured against the learner sensory modality competencies and limitations. For example, the non-reader faces some limitations in the rate and intensity he can receive audio direction. The critical question as to whether one can receive two separate messages simultaneously in two different modalities still plagues media specialists. Some feel that slow transmission of two redundant messages is not harmful. Whether it is more effective than single source and message is still in doubt.

This selection of form and modality is extremely complicated and coupled with both interrogation tactics, overall logistics, and a modicum of manipulative skills is enough speciality for one man, perhaps even too much. Assuredly, it soon will be, as research broadens the knowledge and skill in these areas.

DISSEMINATION VALUE OF THE DEMONSTRATION APPROACH

Dr. John Childs

Introduction

The initial proposal for this project defined a three-fold task for the project staff. Two of the tasks were: "Disseminating the model developmental system," and "Evaluating the dissemination activities." The techniques used to approach these tasks were derived from innovation research reported by Brickell, Rogers, and Miles, et al. The basic design was that suggested by Brickell in the statement: "The most effective way to convince a school staff that it should adopt a new program is to let it observe the successful new program in action. Nothing persuades like a visit."

Under the foregoing assumptions the project staff launched two basic approaches to disseminating the model developmental system: First, the training of institutional demonstration teams; (this in itself constituted a form of diffusion). Second, the process of having the demonstration teams work within their own institutions on the application of the model developmental system.

In the reports from the demonstration institutions, two types of dissemination were evidenced. First, dissemination of the model developmental systems occured within the institutions' colleges, departments, and courses. Second, visitors from other institutions communicated with the demonstration teams about the application of the model developmental system.

Definitions

The terms used in this report to delineate the process being discussed need to be formally defined in order to avoid confusion. Such formal statements follow:

1. Dissemination - the process whereby an innovation comes to be shared.

   Dissemination - process of spreading innovations into schools.

2. Diffusion - the process by which an innovation spreads.

3. Innovation - "an idea perceived as new by the individual(s)."

   Innovation - "a deliberate novel specific change, which is thought to be more efficacious in accomplishing the goals of a system. . .The element of specificity might more easily be labeled 'thingy-ness.'"

4. Adoption - a decision to continue full use of an innovation. The adoption process is the mental process through which an individual passes from first hearing about an innovation to final adoption.

   Adoption of innovations - "(1) acceptance, (2) overtime, (3) of some specific item--an idea or practice, (4) by individuals, groups, or other adopting units, linked to (5) specific channels of communications, (6) to a social structure, and (7) to a given system of values or culture."

Evaluating the Usefullness of Demonstrations as a Dissemination Method

The preceding formal definitions leave a considerable amount of room for interpretation. There is some inaccuracy in the application of these terms in this document. The user of the innovation concept to account for change in the educational institution frequently applies the terms "diffusion" and "dissemination" interchangably. The two words often take the place of "innovation."

The definition given above for "adoption of innovation" is more precise. In the current study the third through seventh sections of the definition are actively pursued. Emphasis in this segment of the report focuses on the individuals and groups, the communications channels, and the social structures. The specific item(s) being "diffused" or "disseminated" is (are) the model of instructional systems development. In essence, the "process" is the item. Under such circumstances the traditional use of terms applied to the "adoption of an innovation" becomes difficult. A process conceptually may have "itemness" characteristics, but when the communication of the process is attempted, the characteristic of itemness is difficult to identify and define. In the case of this project, the most tangible, item-like representation of the innovation being disseminated, is the symbolic model of the developmental procedures in the design of instructional systems. The person who turns to the project for a tangible product, when asking what was disseminated, will be grossly misled and probably disappointed with the tangible representation of the innovation--the flowchart of procedures.

The distinction made above between an attempt to disseminate a "process," rather than a "product," is most important. The bulk of previous research on "adoption of innovations" has focuses on product innovations. While a product-oriented model was selected for the basic strategy, the item being disseminated turned out to be a "process." The techniques for disseminating "process" innovations in a demonstration mode were not defined in advance of actual operation. Thus, much "feeling around" took place in the communications process to determine methods for expressing the substance of the innovation within the demonstration institutions. The actual dissemination attempts within institutions became highly personal, individualistic, and display much variance.

In addition to the dissemination activity within the demonstration institutions, mass efforts were conducted at national conventions and by publications from the coordinating unit. Assessment of these activities was limited. However, the volume of correspondence requesting information indicated that much information concerning the existence of the project, and its efforts, was transmitted through the papers present at the various conventions and by way of mail correspondence. The coordinating unit retrieved from its files 88 letters of request, based on the 1965 AERA presentation and on the 1965 and 1966 DAVI presentations. In general, these letters requested copies of the various papers. Some asked for more specialized information concerning application of the procedures in the systems development model.

The dissemination activities within the individual institutions participating in the study were tapped by survey questionnaires, direct interviews, and personal reports of the participating staff. The data are summarized on the following pages.

The instruments used in an attempt to keep track of the various dissemination activities in this project produced only nominal data. As the project developed, increasing emphasis was placed on the further development, refinement, and assessment of the validity and reliability of the systems development model. This led to a reduced emphasis on the collection and study of data relevant to the "adoption of innovation;" consequently, assessment of the results of dissemination activities in terms of specific adopters were impossible. Available data were limited to the personal viewpoints of the participants and the selective perceptions of the project evaluators and the advisory committee. The "who, what, when and where" descriptive data collected tended to indicate a widespread knowledge of the existence of this project among college and university personnel making intensified efforts to improve instruction.

From the beginning, some very basic dissemination data were lost to the dissemination evaluator by the very nature of the project. Those initial contacts between project staff members and potential adopters necessarily were unrecorded in many cases. The interest of the demonstration teams in the refinement of the model also reduced the amount of effort devoted to the dissemination phase. This would be expected whenever a given innovation had not reached the initial acceptance stage where it could be applied without major alteration. The "process" nature of this particular innovation operated to decrease the probability that the innovation would be applied in its disseminated form. Thus, it became difficult to trace dissemination events to actual adoptions.

It would be hazardous to generalize basic dissemination data for this type of "process" item from this study. The variables operating in each demonstration situation were largely undefined. Yet, it appears quite evident that they were extremely different for each situation. One might find it possible to generalize the model to other situations, but the dissemination procedures remain largely untested as to their validity or reliability in other applications.

Some major pitfalls might be held up for consideration in other situations where the innovation is a "process" rather than a "product." First, some basic understanding of the process must be a part of the demonstration team's repertoire before attempts are made to communicate the "process" to other potential adopters. Second, evaluative and refinement efforts should not be a part of the dissemination effort. Probably both should precede the demonstration phase. While this project adopted the demonstration design in order to facilitate the communication of the model, Brickell's further comments about the conditions of the demonstration were largely ignored. Brickell points out that "anything which the observer could lable 'abnormal' or 'unrealistic,' such as the enriched conditions necessary for good design or the controlled conditions necessary for proper evaluation, is sufficient to rob the observed program of persuasive effect." In this project, dissemination was hampered by the need to refine and evaluate the model, by the lack of a "normal" environment for the application of the "process" (time pressures, extra funding, etc.) and by the absence of adequate training for the demonstration teams.

In summary, it appears that a great deal of dissemination occureed in this project of a "process" systems development model. The dissemination occurred through personal contacts, demonstration center visits, national convention papers, and published articles. Presentation of the tabulations of these events for each demonstration center follows.

SUMMARY OF DISSEMINATION INFORMATION REPORTED BY THE UNIVERSITY OF COLORADO

No. of courses to which the procedures of the project were applied:
Four

No. of faculty persons involved in the project:
Ten

No. of refusals of the procedures by individual faculty members:
One

Communications concerning the effect and future use of the project procedures:

On January 19, 1967, a conference was held to communicate information about the project and to interest staff members of the university in the application of the procedures.

Eighteen faculty representatives attended this conference.

Twenty-four guests from other institutions attended this conference.

The procedures of the project were presented to the spring meeting of the Colorado Audio-Visual Association.

Many additional informal discussions were held to interest persons in the systems procedures. These included: Boulder Valley School Administrators (initial reaction was that they would apply the system); Airforce Academy; WITCH; and WITCHE.

Special documents used in dissemination of the project procedures:

Instructional Systems Development brochure produced at Michigan State University by the co-ordinating unit (green).

Brief dittoed summary of the project at the University of Colorado.

Project document labeled "Aid to Identification of Course Objectives: Part I."

Proposal document for the assessment of adoption behavior with regard to the model development system (prepared by John Childs).

Brief summary material prepared from the *Taxonomy of Educational Objectives - Handbook I: Cognitive Domain* (Benjamin S. Bloom, Editor).

Brief summary of material prepared from *Preparing Objectives for Programmed Instruction* (Robert F. Mager).

A slide, audio-tape, video-tape presentation was prepared for the January 19 meeting on the campus. A copy was reviewed at Michigan State University.

Visitors to the Demonstration Center:

Those representatives named above as attendees at the January 19, 1967 Conference.

Selected comments of visitors:

"The idea is sound." "We would hope to establish such a system." "An organized means of improving instruction is definitely needed."

Selected comments of the demonstration team as reported on January 26, 1967:

"The organization of the team (Media; Evaluation; Learning) is appropriate and should operate as a team."

"Three to five years is needed for evaluation and recycling of a given course."

"To be effective, there is a definite need for released time for the faculty members involved, as well as the team members."

"The system can be adopted to all levels of education and all subject areas."

SAN FRANCISCO STATE COLLEGE

No. of courses to which the procedures of the project were applied:
Two

No. of faculty persons involved in the project:
???

No. of courses to which the procedures were applied outside of the project:
Two

No. of faculty persons using the procedures outside of the project:
???

Communications concerning the effect and future use of the project procedures:

Reactions to a number of individual requests for information.

Presentation to the faculty of the School of Education, History Department, Psychology Department, and Economics Department.

Special seminar for the School of Education.

Special seminar on systems economics which included representatives from local school districts, San Jose State College, and Foothill College. This seminar was held off-campus.

Selected comments of visitors:

"Specific curriculum revisions are occurring as a direct result of the project."

SYRACUSE UNIVERSITY

No. of courses to which the procedures of the project were applied:
Two

No. of faculty persons involved in the project:
Two

No. of faculty persons using the procedures outside of the project:
Eight

Communications concerning the effect and future use of the project procedures:

Mr. T. E. Burford reviewed the Instructional Systems Development Project, its nature and progress, with Dr. Taher Razik, Director of the Audiovisual Department, SUNY at Buffalo.

Mr. C. M. Koch presented a lecture on the Instructional Systems Development Project at the New York State Educational Communications Council Convention in November, 1965.

Mr. Koch, now director of Learning Resources, SUNY at Cortland, is now using the project procedures in that institution.

A one-day conference was held at Syracuse on March 10, 1967. Invited participants were: Deans and/or Vice Presidents for Academic Affairs at New York State Schools of Education and their audiovisual people. Approximately 60 representatives of 28 institutions attended.

A special presentation was made for representatives from Cornell University, Ithaca, New York. Nine persons were included in this group.

Special documents used in dissemination of the project procedures:

One-day conference program.

Four-page, 8-1/2 x 11, printed brochure with photographs entitled: Instructional Systems Development Project, Center for Instructional Communications, Syracuse University.

Kinescope of teaching activity in specialized classroom, using resources and techniques developed through the procedures, with commentary by the subject instructor, as to the effect of the system procedures of the project.

Visitors to the Demonstration Center:

Those named above as attendees at the one-day Conference, plus those from Cornell who attended the special presentation.

Selected comments of visitors:

"Very interested in systematic approach to course development."

"Interested in development and utilization of multimedia classrooms, both hardware and software."

"Interested in applications and utilization of computer-responder system."

"General interest in the heuristics of course development activities."

"My primary concern is for cost analysis of development activities."

"Professors have little time for planning classes or stating behavioral objectives. We know that the media can make the job more effective and more efficient."

MICHIGAN STATE UNIVERSITY

Presentations of activities were conducted by the project demonstration and coordination units in:

a. USOE Demonstration Center
b. State conventions (2) of the Michigan Audiovisual Association
c. Staff of the College of Human Medicine, M.S.U.
d. MSU, Title VIB Media Institute Program in Higher Education
e. MSU, NDEA Title XI Institute for College Media Center Directors
f. Faculty Members at Indiana University
g. Media Institute Participants at Teachers College, Columbia University
h. National Conventions (2) of the Department of Audiovisual Instruction
i. Faculty members at the University of Connecticut
j. Faculty members at the University of Illinois at Chicago
k. Wayne State University, NDEA Title XI Institute on Instructional Systems Development
l. MSU, Special Media Institutes (5) for Directors of NDEA Title XI Institutes for Advanced Study in Geography and Economics
m. Articles in the periodical Audiovisual Instruction, Department of Audiovisual Instruction, National Education Assn.
n. National Audiovisual Leadership Conference at the University of Iowa Lakeside Laboratory
o. National meeting of American Association for Educational Research
p. Convention of the National Association of Educational Broadcasters

The response to these presentations was encouraging. Participants indicated considerable interest in obtaining copies of the summary report depicting the outcomes at all four institutions. Correspondence indicates that observers referred other parties, not attending the presentation, to make inquiries also.

COST ANALYSIS OF DEVELOPMENT PROCEDURES TRIALS

Despite the fact that this study was aimed primarily at obtaining data on the efficacy of certain instructional development procedures, inevitably someone is bound to raise the question concerning the costs involved. The investigators observed in the 1963-65 study at Michigan State, that the bulk of expenditures were for the costs of specialist and faculty member time to carry on development activities. The expense of graphics, photographic supplies, videotape and other newer media supplies were small by comparison. This same relationship of costs appears to hold true in the four-institution trial of the development procedures. All participants were made aware, before joining in the project, that the funds provided by the United States Office of Education would be insufficient to cover complete personnel costs, including faculty release time and staff specialists. Project funds were budgeted to insure the purchase of the raw materials for media production and the use of associated technical services to fulfill the decisions reached in the development deliberations.

In an attempt to account for the overall investment in development time and dollars for materials needed to carry out the commitment in the analysis and revision of the two selected courses, a cost and time estimate for faculty, specialists, technicians and materials were submitted by the demonstration institutions. These data include expenditures covered by the project grant and in addition time and materials donated by individuals and the institutions.

It must be emphasized that the data reported here was not collected through exact accounting procedures, and represent primarily gross estimates of materials and effort entering into the course development efforts.

This estimate summary covers costs and time expenditures over a two year period for development in two courses of instruction that each enroll a minimum of 500 students per year.

1.	Faculty member time for development deliberations	800 - 850 hours
2.	Instructional Specialists, Media Specialists, Evaluation Specialist time for deliberations and media development activities.	3500 - 5000 hours
3.	Media production technician time	800 - 900 hours
4.	Expenditures for materials and equipment rental	$10,000 - $13,000

It is observed that development time easily outdistance the costs of materials in the instructional development process. The experience in this project suggest a 4:1 ratio exists between the expenditures for development procedures and the costs of producing and implementing the newer media. Those contemplating renovation of course instruction would do well to allow sufficient resources for development work as insurance that their ultimate choices of teaching methods and materials are the most effective available.

CHAPTER IV: DISCUSSION

The instructional development steps examined by the specialist teams and demonstrated for educators visiting their institutions cannot be considered entirely novel. The skills underlying decision steps are the products of experience and research in the fields of learning, evaluation, and instructional media.

At the start of this project, the demonstration specialists and workers at other institutions, already possessed some of these knowledge and skills and had applied them in the past to instructional design problems encountered in professional assignments.

The innovative aspect of the project was teaming specialist capabilities to the decision process of the instructor and bringing them to bear on instructional problems under the guidance of a preconceived, sequential system of decision-making.

The actual worth of any such plan can largely be judged by its ability to observe the prerogatives of the academic community, and yet encourage the soul-searching necessary for identifying needed changes in methods and materials. This chapter presents some key observations in this respect offered by project evaluation, development specialists and faculty members at the periodic Project Review Meetings.

OBSERVATIONS OF AN EVALUATOR ON THE PERSONAL PERFORMANCE OF PARTICIPANTS EMPLOYING THE INSTRUCTIONAL DEVELOPMENT MODEL

1. Difficulty in dealing directly with behavior objectives:

The implication is that in the flowchart the item "Specify Entry and Terminal Behaviors" comes in a step which is very early in the development process. Thus, if there is difficulty in this specification, either the flow stops, or there should be some way for running through the system at a low level of approximation and then cycling back to re-establish a better standard in this step and re-run the system successfully to upgrade the specifications it produces.

2. The relative absence in some instructors of a repertoire of evaluative rationale (testing and measuring) and evaluative instruments.

The implication here is that in the flowchart there is the idéntiffcation of an evaluation specialist in the goals and objectives identification step; however, in some of the tapes there was little mention of this aspect, and the efforts to meet with the department chairman or coordinator of subject matter gave enough evidence to suggest that it would be hopeless to have started on this point of determining the evaluative devices and instruments. For example, it seemed to this listener that the only criterion that the one chairman of the department would have injected would be that, whatever other people asked for, his standards would have to be ten percent more difficult.

3. The limited perception of the instructional media and the role of media specialist:

Limiting these to the simple task of making or transmitting, BUT NOT INTRUDING EITHER ON THE SELECTION OF THE MESSAGE NOR THE EVALUATION OF THE MESSAGE. For example, in the tape dealing with course A, it was very evident that the instructor and the whole activity was geared to a concept of feedback and all the instruments of any type were acceptable for that purpose; but in course B there was no such intergrated approach, even though the coordinator and the media specialist were continuously injecting the invitation to become more involved in the evaluative feedback activities. In the course B development team, the media specialist had to buck against a very limited perception of media function and of role of media specialist.

4. The differences in the application of the development model that are dependent upon the subject matter.

In some tapes, there are illustrations between course A and course B; and more specifically between the course B as general education and course B in a professional sequence. Obviously, all of these are subject to interpretation by the instructor, but it is such interpretation that changes the nature of the subject matter. Some subject matter is more in a verbal domain, some more in visual domain, some more in audio domain. Some is structured in relationship of "if-then" relationships, some open-ended to produce a "gee-whiz" effect.

5. Differences in instructional styles and in the learning styles of students.

It seemed very significant to this listener that course A professor identified himself as being characterized as unusual, even among his colleagues, as a person who thought visually and who used visual metaphors in his instruction. It was extremely easy to follow this instructor and the instructional development team in their conversation both as to what is to be accomplished in the course, the behavioral outcomes and the relative level of performance of these behaviors, and strategies and instrumentation for the desired instruction. By contrast, the instructor of course B seemed quite incapable of illustrating exactly the points he was making. Strangely enough, to me it seemed that this latter person was more dependent upon concrete instructional materials than he realized and much more so than the other instructor -- who undoubtedly used more and a greater variety. Specifically, the course B instructor impressed this listener as being the kind of a person who is dependent upon a text and pre-prepared materials which he could use in an assign-study-recite-test organization -- the role of the live instructor being that of making the assignments tougher and pushing the students more intensively and rapidly along the established continuum. But, there is little evidence that he sees this dependence nor that he wants to understand the medium and the learning styles the medium imposes on the student and the instructor.

Note: The implication for the development system model is that it does not take into account either the concept of levels or the concept of different strategies either for the instructor or for the learners. By developing the model as an illustration applied to any module or bit of a larger instructional sequence, this difficulty could be overcome in applying the model to the whole job of planning a course.

6. Personality differences and ego involvements of the instructors.

Some instructors could ruin this system or this system could ruin them. The implication for the chart is that there probably should be some kind of a no-go check point that screens out something that shouldn't be thrown into this system. In the summary to the questions following a development conference, one of the participants indicated that he was pleased with the prospect of not having any further dealings with another participant. This is an excellent insight revealed from a normally hidden agenda; and it suggests provision in the flowchart model to kick out raw materials that cannot be ingested into the system without damaging it.

REACTION OF A FACULTY MEMBER TO DEVELOPMENT PROCESS EXPERIENCE

"Having played two roles in the course development project, it is extremely difficult for me to assess the value of the project from either point of view. One of the reasons for this is my feeling that IF I had not been involved as a member of the committee, I probably would not have stayed with the project as a faculty guinea pig. There were times when the committee challenged my choice of goals and methods, and in so doing, forced me into the uncomfortable position of admitting that I might be wrong in a decision made so long ago it had been forgotten. Having stayed through once cycle of the project, though, I can say that the things that made me so uncomfortable were the things that needed doing in the worst way. In short, participation has been a painful but valuable experience -- rather like the army.

One of the major weaknesses of the project seems to be its obviousness. That is, I felt (and others have indicated the same feeling) that the "systems approach" didn't tell me anything I didn't already know. After you've seen the system, there are just two things you can say: "Of course." and "So what?" To put it another way, the project (as I understand it) seems to be testing the hypothesis that a planned course is more effective than an unplanned course. This hypothesis is "obviously true" and at the same time "demonstrably false". That is, it would be a rare event indeed if a totally unplanned and disorganized course succeeded at anything, and on the other hand, planned nonsense is just as nonsensical as unplanned nonsense.

My conclusion is that the chief value of the project does not lie in the formalized system. Good teachers plan without it, and bad teachers can be bad in spite of it. Rather, the project's value derives from the "fact" that group decisions, under conditions of high uncertainty, tend to be better than decisions made by an individual. It is the "head bumping" that counts rather than the order in which it is done. IT HELPS WHEN THE "HEADS" DO NOT ALL HAVE THE SAME BIASES.

A second value of the project, for me as an instructor, was that it provided funds to implement certain media decisions that could not have been implemented otherwise. Money, of course, can come from any source, but the project has served to demonstrate that a relatively small amount of money can open doors that normally stay closed -- can make possible better teaching. (I might also add that a small sum can do more for a teacher's morale in a "materials budget" than added to his salary. Large sums should, of course, be added to his salary.) I must also add that all the media experiments FAILED: the special rating sheets turned out to be unmanageable; the overhead materials were invisible; and the video taping of speeches almost sunk the ship (attendance dropped by almost 50% and isn't back to normal yet) BUT we learned from these experiences what we could not have learned any other way. Having made these "blunders" in an experimental stage, we were not so committed that, psychologically, we were forced to deny the failure, or, administratively, forced to repeat the "blunders" to justify having made them in the first place.

A third value of the project has been that it has given me the self-confidence and the authority to introduce a new course.

Yesterday (April 19) my department approved the offering of a new course modeled after the course which we worked on in the project. Sure, I'd had the idea for a long time, but not much had been done with it. Working in this project, the idea was refined and polished. I gained confidence from talking it through with the committee. My colleagues, knowing that the idea had been through the mill, were more willing to give it a try. NOW WE HAVE TO MAKE IT WORK!!!

My major regret is that the project facilities (including the people) may not be available when I need them most -- next year.

OPINIONS OF PROJECT DEMONSTRATION TEAM MEMBERS REGARDING RELATED ASPECTS OF INSTRUCTIONAL DEVELOPMENT

In the process of conducting the Project a number of new questions arose which were not a part of the original plan of investigation, but on which the demonstration teams contributed opinions. These responses are reported here under the general statement of the question asked.

What conditions best augur the commencement of instructional development procedures?

Answers:

1. A committment by the institution's administration for funding and faculty release time.

2. Approval and support of the college dean and deparment chairman.

3. The course is a required course or "basic course."

4. Willingness of the instructor to experiment with change.

5. Recognition that the course is in bad shape.

6. Availability of development time for both the instructor and specialist staff members.

What factors contribute to the continued use of the instructional innovation, if there is a change of instructors?

Answers:

1. Number of faculty members teaching a given course and their agreement on changes.

2. Degree or amount of positive reaction by students and an increase in achievement by students.

3. Ability to secure and maintain needed facilities and/or equipment necessary to continue innovations.

What evidence of attitudes toward the results of your work in instructional development have you observed on the part of students?

Answers:

1. Favorable comments on changes.
2. Achievement evaluation was not done.
3. Faculty member reports positive change in students.

On the part of participating faculty?

Answers:

1. Majority favorable and appreciate the opportunity.
2. One member of faculty used experience to establish a major revision of course involved.
3. Promotion received by one faculty member due in part to ISD involvement.
4. Participating faculty devoted outside time to project.
5. Faculty member reported positive change in self.

On the part of campus administration?

Answers:

1. Vice President has written of interest in evolving educational development program on basis of project accomplishments.
2. Meetings are scheduled to discuss permanent organization of instructional development agency.

On the part of members of the development teams?

Answers:

1. Three of four members are favorable and are interested in permanent establishment of the development process. The other member regards the process as too time consuming and strictly promotion of media.

2. Instructional development work is regarded as an avenue for increased recognition.

3. Acknowledgement that the process requires great sensitivity to and empathy with instructor's problems.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

A number of specific conclusions and recommendations pertaining to instructional development have already been presented in the reports of activities at the four participating universities. Accordingly the investigators here restrict their comments to conclusions related to the stated objectives of the overall demonstration and evaluation project. In the order they appear in Chapter I, they are:

1. To select and orientate innovative institutions to serve as working models of systematic instructional planning which utilizes the entire range of newer media.

There is little question that a measure of the success enjoyed by the four institutions in this project can be attributed to a store of experience accumulated from successful media implementation in the past. The selection of these particular institutions was influenced in part by the need to find universities regionally located for easy access to visitors, and in part by the ability of the institutions to complete project activities within the deadlines imposed by the relatively brief two-year term of this study. Even though the institutions involved in the project already possessed varying amounts of experience in analyzing instructional problems and implementing the newer media in courses, the requirement that they use and refine a novel development model was sufficient to present a new challenge to their expertise. The project encouraged demonstration institutions to (1) define their steps for instructional development; (2) review, evaluate, and consolidate the media resources already available for instructional programs: and (3) establish a coordinated specialist team for instructional development assistance to faculty.

The investigators can only conjecture as to the effect this project might have on institutions having a lesser history in media and instructional development.

It is probable that institutions new to attempting specialist-assisted instructional development may need to invest more time in the introductory activities which precede the development procedures tested by this study. The decision process embodied by the development flowchart operates best when there exists a mutual trust in the abilities among faculty and specialists. The project demonstration institutions were able to capitalize on confidence already established with faculty and move into testing the development procedures almost immediately.

2. To evaluate their demonstration method of disseminating information by gathering data relevant to the adaption of the developmental systems from visiting institutions.

There is little reason to dispute the general value of demonstrations as a means for disseminating information. However, the investigators believe the experiences of this project underscore some limitations of the demonstration method which also is supported in writings by Brickell and others. That is, the demonstration method is of greatest use in communicating information about concrete materials and short-term processes.

In the case of instructional development, a situation where deliberations are complex and often stretch over weeks or months, it is very difficult to convey its many aspects to visitors. The dissemination activities of both the demonstration institutions and the coordination unit proved most effective when they were confined to discussing the issues surrounding the development activities and exhibiting materials resulting from the development process. Examples of information easily communicated are printed and taped comments reflecting the attitudes and reaction of faculty members to the analysis of instructional problems, the organization of the development team, graphic representation of the development steps, concrete examples of decision-making, instructional materials produced for use in courses, and budget information. Transcriptions of the actual faculty-specialist deliberative process did not get across as well.

However, visitors who were experienced educators were able to infer a good deal from representative presentations and did not require literal reenactment of the development activities.

3. To evaluate the (a) feasibility, and (b) reliability of this developmental system within institutions, first (hopefully) with a common course, and second, over other key courses.

The measurement of feasibility and reliability in a strictly empirical sense was not seriously considered in designing the project. Investigators agreed early that the diversity of activity likely to result from the work at the demonstration institutions would make difficult the standardization of data for comparison. Instead, evaluation was keyed to achieving some consensus among the members of the Project Evaluation Team who would have an opportunity to inspect both detailed and summarized data submitted by the demonstration institutions. Thus, their estimate of feasibility for the development system model was a judgement of general usefullness for other institutions, based on the results of trials at the four project institutions. Feasibility would have been best tested if two of the demonstration institutions differed widely in personnel and material resources, and yet succeeded equally in achieving substantial improvements in identical courses of study.

In fact the four institutions did exhibit differences in organization and competencies available, but hardly enough to test the development procedures under extreme differences, e.g. an institution which had few media facilities or experience in implementing media in instruction. The variance in existing facilities and staff competencies represented by four project institutions resemble a large number of colleges and universities. Evaluators found little evidence to suggest that the development steps were not compatible with most settings in higher education. Indeed the changes made by the demonstration schools in the instructional development steps were relatively minimal and did not reject the proposed sequence of the process.

The reliability of the development process, i.e. its ability to deliver again and again in the same setting what it purports to do was a quality also difficult to measure. Only two courses were selected for treatment at each institution, and at the writing of this report work is incomplete in the second course at all four schools. The opportunity to measure reliability comprehensively suffered somewhat, when it was impossible to work in the same courses at all four project institutions.

The few common observations that may contribute to questions of reliability pertain to faculty attitudes and development team specialists progress in working with instructors. The fact that a common development model was proposed is generally credited by observers with facilitating development work. Under the circumstances, the specialist knew better at what stage he was working, what had been accomplished and what to prepare for next. The instructor too generally felt secure because of the identity the model gave their concerns, once only intiutively harbored. The model was described by one specialist as a "roadmap" for instructional development.

4. To refine the system's organization and operating procedures, both in light of above evaluation and the re-evaluation of a second trial.

Refinement here refers to reordering development steps in a new sequence, increasing the specificity of development steps, altering step size and/or introducing new ones. Some development specialists preferred to reduce the number of steps by consolidating some and deleting others. Only one institution chose to alter the sequence of the steps. This was done simply by joining the initial and final steps of the flowchart to depict a circular or recycling process model. The other institutions found that introduction of previously omitted feedback loops in the flow of development activities accomplished the same end as did the creation of a circular model.

Despite the reported decision by development teams not to introduce new steps to the flowchart, evaluators observed a number of short-cuts or enabling activities individual specialists used to progress in their work. The evaluators agreed that these ploys and strategies were tangential to the process anddid not qualify as full-fledged development steps. They chose to call them the "heuristics" of instructional development.

These procedures constitute a hidden agenda for the development team specialist and often spell the difference between success and failure in the operation of the flowchart development steps.

Interestingly,some specialists found it practical not to reveal even the flowchart steps to the instructor. They tended to inhibit discussion of teaching problems by faculty members who felt most at ease talking in their own terms.

5. To devise and build in a means for generating research hypothesis within the developmental system.

and

6. To prepare a prototype list of research hypotheses that have been generated by the working demonstration models.

The success of efforts aimed at these two objectives fell below the level of the investigators expectations. They now believe that the successful pursuit of these two goals may require the investment of more time and resources than could be spared within the framework of this study. Actually, the development procedures generated a large number of questions, but only a few could be regarded as readily researchable hypotheses. In short, a good question does not qualify as a research problem, when it is unmanageable by known research technology. The Evaluation Team observed that few experimental techniques and designs now exist that are suitable for the problems generated by the development procedures.

However, the effective question-producing operation implicit in the tested development steps could be considered as hypotheses-generating, if the Bayesian-type statistician were available to enter the scene. Unfortunately, few are available and none in this project.

7. To sponsor major symposia at DAVI and AASA conventions, the participants being members of the demonstration teams and project staff.

In addition to dissemination efforts at the demonstration institutions, a number of presentations were made in general sessions of large professional meetings. These served different purposes and audiences than did the demonstration institution clinics. The programs gave substance to instructional development discussions which previously were largely hypothetical. In addition they spurred interest in practicioners to replicate and further test the development procedures involved in the project and visit demonstration clinics for more detailed information. Finally, the evidence presented at these meetings sharpened the definition of terminology associated with media and instructional design efforts.

8. To aid the participating demonstration institutions in preparing summary presentations which capitalize on the advantages of media application.

All four demonstration institutions have produced film-recording and/or videotaping documentary narratives of their course development experiences. Generally, projects such as this one find the demand for information on findings lags the conclusion of the study by a period of six months to two years. In order to prepare for this eventuality and preserve data in their most concrete form, Syracuse University has undertaken to produce a brief filmed record of their work. The University of Colorado has already produced a videotape of development session and used it in their clinics. San Francisco State College likewise is in the process of videotape production, while Michigan State University has elected to produce filmed excerpts for examples and documentation of instructional development.

CHAPTER VI: SUMMARY

In the aftermath of unprecedented changes in physical size and enrollment of colleges and universities, some institutions have considered creation of centralized instructional development agencies to assist academic departments and individual faculty members innovate teaching methodologies and materials.

The United States Office of Education-sponsored study A Procedural and Cost Analysis Study of Media in Instructional Systems Development (OE-3-16-030) conducted at Michigan State University from 1963 to 1965 describes a number of cases where the implementation of newer media was pivotal in increasing the effectiveness of instruction in courses with large enrollments. In addition this study produced a hypothetical instructional development model to serve as a guide to faculty members in the analysis of problems of instruction and selection of appropriate forms of the newer media of communications. The use of these development procedures is based on the employment of professional assistance provided by an instructional specialist, an evaluation specialist, and a media specialist.

The faculty member working with these three specialists seeks to make an optimum choice in a series of decisions related to teaching strategy, evaluation methods, content selection, and newer media utilization. The flowchart for these decisions appears in Figure 1, page 5. The limited opportunity this investigation provided to evaluate the worth of this hypothetical instructional development model was expanded through a new two-year USOE-supported study Instructional Systems Development: A Demonstration and Evaluation Project. This follow-up investigation was conducted during 1965-67 and involved four institutions, Michigan State University, the University of Colorado, Syracuse University, and San Francisco State College. The overall purpose of the new project was to refine by trial the development steps defined in the earlier study and in the process disseminate this expertise to neighboring colleges and universities. Specifically the project objectives were:

1. To select and orient innovative institutions which are to serve as working models of systematic instructional planning which utilizes the entire range of newer media.

2. To evaluate this demonstration method of disseminating information by gathering data relevant to the adoption of the developmental system from visiting institutions.

3. To evaluate the (a) feasibility, and (b) reliability of this developmental system within institutions, first (hopefully) with a common course, and second, over other key courses.

4. To refine the system's organization and operating procedures, both in light of the above evaluation and the re-evaluation of a second trial.

5. To devise and build in a means for generating research hypotheses within the developmental system.

6. To prepare a prototype list of research hypotheses that have been generated by the working demonstration models.

7. To sponsor major symposia at DAVI and AASA conventions, the participants being members of the demonstration teams and project staff.

8. To aid the participating demonstration institutions in preparing summary presentations which capitalize on the advantages of media application.

9. To produce a summary document which (a) describes the major steps taken by the demonstrating institutions in implementing a systematic approach to instructional planning; (b) contains the final form of the development system; (c) includes diffusion data representing the number of visiting institutions and those which have shown evidence of system adoption; (d) offers a prescription for the curricula of substantive degree programs based upon role-task specification of system specialists; and (e) presents comparative cost data for instructional systems development at each of the demonstration institutions.

Each of the four institutions organized instructional development teams composed of appropriate specialists and selected courses of study for review and revision. The study required that the courses selected be in different academic departments and enroll at least 500 students per year. Short of these requirements, the institutions were free to select and deal with whichever faculty members appeared to have immediate need for assistance and were willing to experiment with the development steps.

The other organization within the Project consisted of a Coordinating Unit for overall administration and a Project Evaluation Team. The Project Evaluation Team consisted of specialists from three other institutions, who were given access to all data generated by the study and asked to judge the generalizability and worth of the hypothetical model on the basis of experiences observed at the four institutions. Data on these development experiences was obtained by extensive tape-recording of faculty member-specialist deliberations, periodic written reports and project-wide review conferences.

The course of the investigation was further guided by an Advisory Committee composed of university administrators experienced in institutional research, design of instruction and media services development. The results of the investigation are summarized as follows:

1. Usefulness of the model instructional development flowchart

   All parties to the instructional development trials found the decision steps flowchart practical in analyzing and improving the teaching approach in the selected courses. It served as a good referent or "road map". In some cases specialists found it more effective to deal with the decisions required in the professor's own terminology rather than the technical terms proposed in the model.

2. Appropriateness of the sequence of instructional development steps in the model

   The Syracuse team preferred to view the flow of decision activities as a circular process, permitting initiation of a "development cycle" from any step. The Colorado team found it simpler to deal with fewer steps and proceeded to reduce the model to five major development phases. The sequence remained essentially the same. Michigan State University and the San Francisco development teams were satisfied to employ the model as is.

3. Dissemination of Instructional Innovation by the Demonstration Method

   All four development teams regarded the demonstration method, in this case on-campus clinics, as a relatively ineffective method for communicating the drawn-out process of instructional development. They felt the demonstration method served best in illustrating the "products" of the development process, i.e. instructional materials and physical facilities. The essential give and take of the instructor-specialist transactions could not be recreated for visitors, although some of this flavor was transmitted by permitting the instructor to have lengthy and candid discussions with visiting groups. Each demonstration institution is producing a film and/or videotape documentary of their work.

4. Influence of Instructional Development Project on Participating and Visiting Institutions

It is too early yet to determine the effect the demonstration institution clinics had on visitors. Each development team has reported that definite steps have been taken on each campus to establish a permanent instructional development agency, similar in many respects to the project organization which conducted the trials of the hypothetical development procedures. Michigan State already provides support for such work through the Educational Development Program and its operational facility the Instructional Development Service comprised of the Learning Service, Instructional Media Center and Department of Evaluation Services.